

AUTOMOTIVE INDUSTRIES

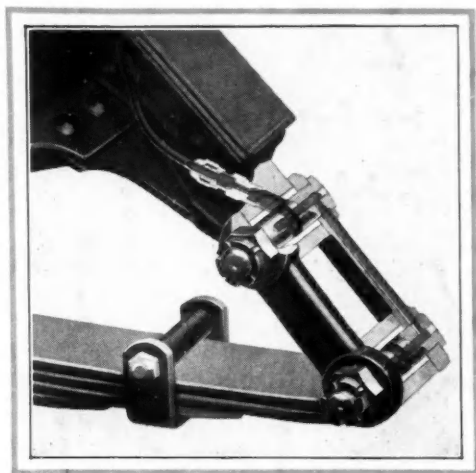
LAND AIR WATER

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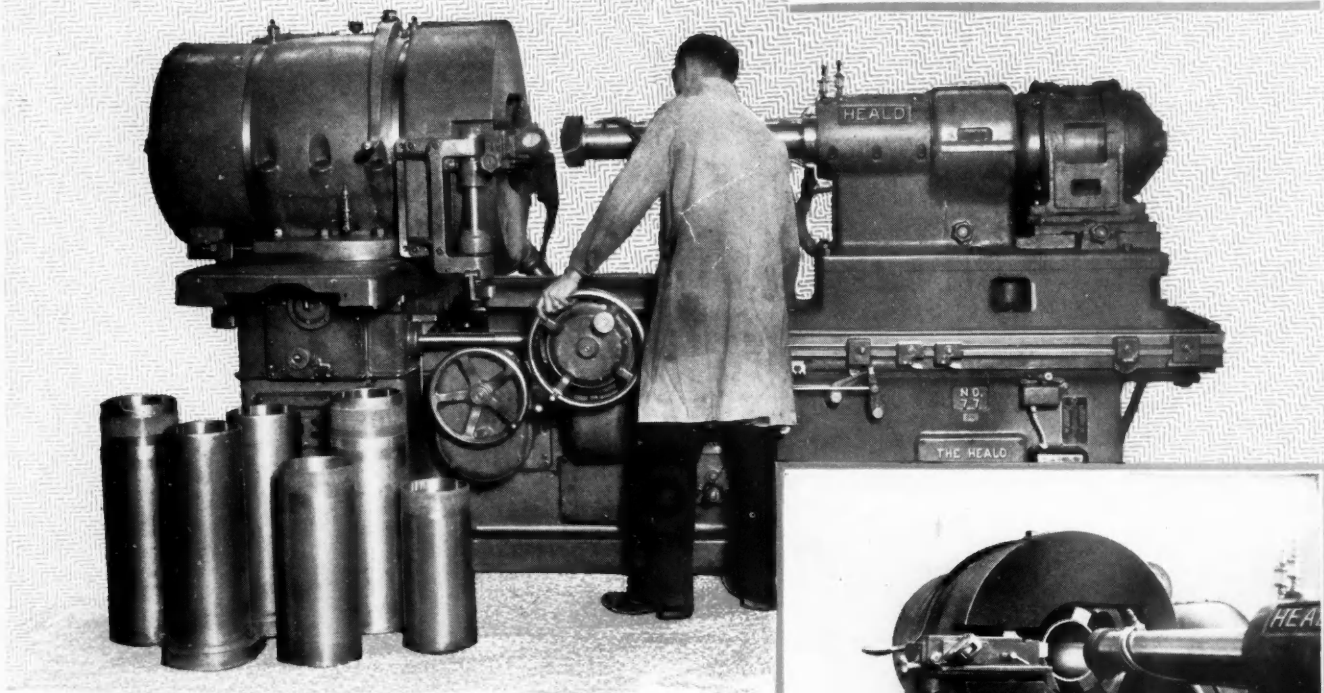
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AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

Vol. 64

Reg. U. S. Pat. Off.

No. 10

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Automotive Industries

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March 7, 1931

A practical solution in MAKING "PARTS"

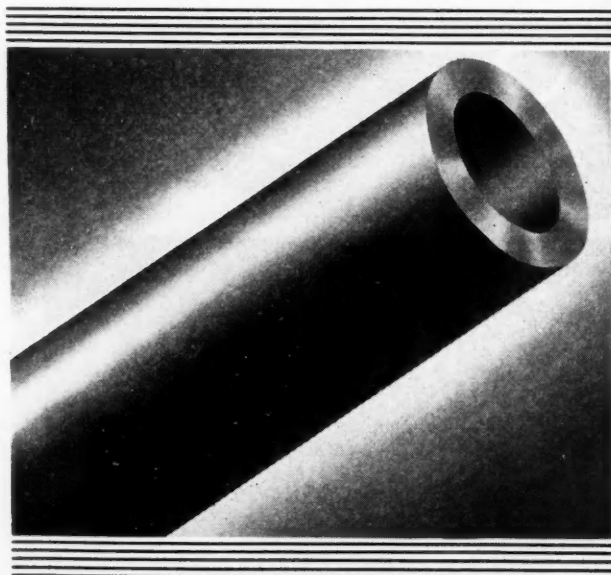
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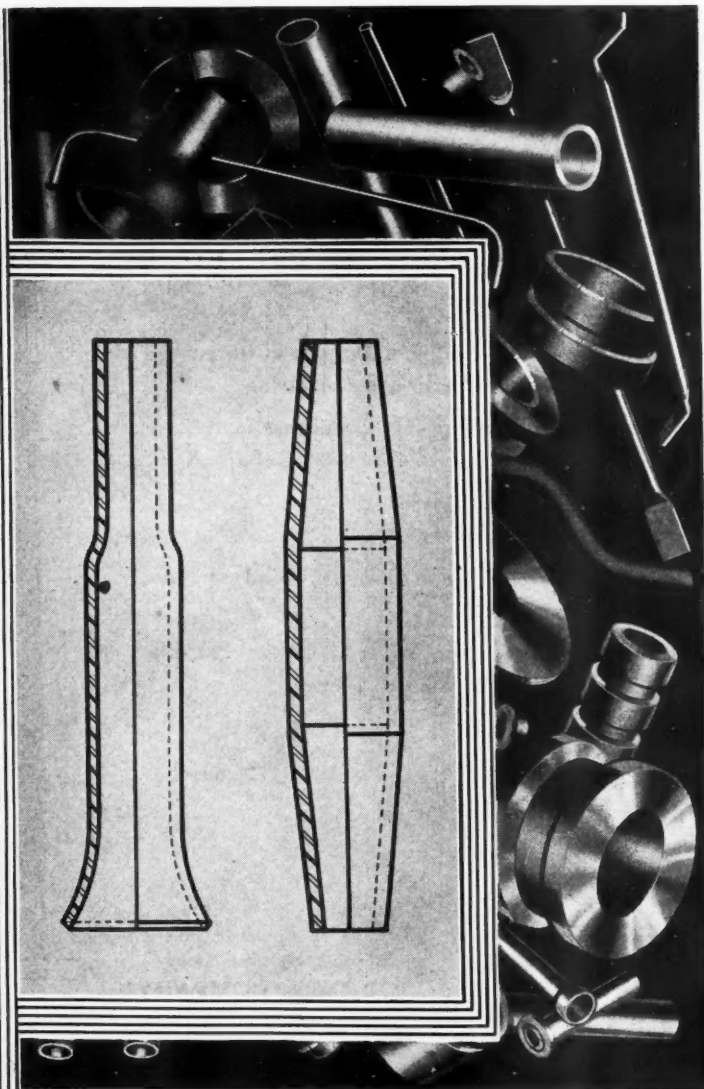
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March 7, 1931



**NATIONAL
SHELBY
SEAMLESS
TUBING**

Automotive Industries

AUTOMOTIVE INDUSTRIES

VOLUME 64

MARCH 7, 1931

NUMBER 10



by

Norman G. Shidle

Either you breathe a prayer of thankfulness for not having lost your life as well as your car and go about your business as before, just hoping that you won't get caught the same way again:

Or you become so impressed with the necessity for elimination of grade crossings, that you see the need for consistent, constructive, continuous effort to bring about such elimination and, as a result, stand ready to take an active part in such effort before another emergency arises.

The whole automotive industry is somewhat in the position of the car stalled on the grade crossing right now with restrictive legislation and heavier taxation in the role of the Flyer bearing down on it as forty-four State Legislatures have swung into action this year with somewhere between 2500 and 3000 bills being proposed which affect automotive interests of one kind or another.

Like the man who jumps from the car to save his life, the industry is this year going to sustain losses comparable relatively to the loss of the car by the man on the track. But it won't be the first car lost; similar damage has been sustained by the industry with great regularity every two years for the past decade or so.

And if the average executive in the industry won't get vigorously excited about possibilities of unfair legislation until about 90 days before the legislators assemble biannually, further losses will accrue in the normal course of events in the future as in the past.

The current battle is at white heat as we write. All along the legislative front, measures to throttle the economic effectiveness of the motor vehicle are being

3000 Legislative Bills Menace the Truck Industry

WHEN your car is stalled in the middle of a railroad grade crossing and the Flyer is bearing down on you at 75 m.p.h., you don't look to the development of a plan for the elimination of grade crossings to keep you from being hit. If you are agile, you jump out of the car and run for safety. The ensuing loss of your car you just write off to profit and loss. Then you do one of two things:

hurled into the State Houses and Senates. Along with them is being laid down a barrage of bills designed to make the motor vehicles pay more even while conditions for earning income are made less favorable.

Within 60 to 90 days the firing will have stopped and the smoke will have begun to clear away. Forty-two of the forty-four State Legislatures which will meet this year already are in regular session. Georgia has been in special session and will hold its regular session beginning June 14. Florida begins in April. The four states whose Legislatures do not meet this year are Kentucky, Mississippi, Louisiana and Virginia.

Only a few of the 3000 automotive bills introduced, of course, will be made into law this year. It is to be hoped that some of them will pass, because certain measures are designed to help the economic development of motor transportation and thus benefit the citizens of the country. Sound thinkers in the industry, moreover, are in no sense opposed, *per se*, to added legislation concerning motor vehicle regulations and taxes, but they are intensely interested in the promotion of legislation which will lead only to proper economic and technical regulation and taxation of motor vehicles.

A good share of the bills now being proposed, however, cannot be interpreted as in this latter category by any stretch of the economic imagination. It's too early to say just how much damage will be done in 1931 to the possibilities for proper economic development of motor transportation, but there is every indication that it will not be small.

The motor truck and the motor bus, of course, are the chief targets of legislative missiles. For the current up-to-date information about what actually is going on in the various State Legislatures we are indebted to Richard S. Armstrong, secretary of the Motor Vehicle Conference Committee. The far-flung and active information service of this cooperative organization has brought together definite data on bills now being introduced and debated, and thus made possible some interpretation of what really is happening.

Bills thus far introduced show definite efforts to increase taxes, impose greater operating restrictions and limit design possibilities in connection with motor trucks.

Particular attention is being centered on lengths of trucks and truck-trailer trains. Three proposals already are before the Illinois Legislature, for example, asking limitation of length of combination of vehicles to 30, 35 and 40 ft. respectively; the present law permits 65 ft. Indiana, which now has no size restrictions, is considering proposals for length limitation of combination vehicles as low as 40 ft. Fifty-foot maximum is being considered in Iowa, where no length restrictions existed heretofore. Reduction from a 75-ft. maximum to 33 ft.,

35 ft., 50 ft. or 60 ft. is getting consideration in Minnesota. And so runs the trend, with reductions in maximum length being proposed in Nebraska, North Carolina, North Dakota, Oregon, South Dakota and Tennessee as well.

An Oregon bill proposes to prohibit six-wheelers in combination; a North Dakota bill is designed to prohibit trailers except when used by "private individuals."

Only very detailed research and analysis could tell in any quantitative way the effect on food and material costs should a majority of these new proposals be written into the laws. That the result must be higher costs to the public is certain.

Width restrictions, too, are getting considerable attention, although, unexpectedly enough, more pressure seems to be coming on lengths than on widths this year.

Pressure to decrease truck weight allowances is common, although study of the bills proposing more load restrictions indicates again that the combination truck-trailer train is a particular target of the legislative sharpshooters.

Higher special taxes on both buses and trucks are being urged all along the line. And a greater tendency is shown than ever before to divert these special taxes to other than automotive or highway uses. A Colorado

bill, for example, proposes a fee of \$100 for the first ton rated capacity, as against the existing tax of \$10 for trucks of that size. An Indiana proposal is for a tax of \$150 for the first ton rated capacity, the present rate being \$20 for trucks of from one to two tons. Similar increases are being asked for in many other states along with regulatory restrictions which will affect, not only common carriers, but in many cases all motor vehicles for hire of every character, and even trucks which are owned and operated as private fleets.

Such radical increases in taxes on light trucks is significant of the tone and character of the current automotive legisla-

tive developments which give evidence of bearing down on the progress of motor transportation from a purely competitive and economic angle. It is important that executives recognize this trend, because there is, perhaps, too general tendency in our industry to feel that these restrictive measures are for the most part the problem of the heavy-unit interests. Restrictive legislation from herein is very definitely an industry-wide concern, involving not only truck and bus makers and operators of all kinds, but the passenger car men as well.

Increases in gas taxes are widely proposed and seem certain of adoption in a number of instances. The seriousness of this trend lies largely in the tendency to use the gas tax as a means of raising revenue for general state expenses and purposes. This latter tendency probably is responsible in a large measure for such

Start Mobilizing

"It is high time for the motor truck owners to make themselves felt in every state in the union. This can be done only by strong organization. Let's get into action with an aggressive well-planned campaign. Start mobilizing at once and prepare to swing into the battle line a force that will carry through to victory."

—M. L. Plucher, president, Federal Motor Truck Co., and member N.A.C.C. Motor Truck Committee.

THE campaign to hamstring highway service and increase its cost so that railroads may be in a position to compete with it, is creating new interest and additional memberships in state truck owner associations. During the past year, and for the most part during the past few months, new truck owner associations or reorganized associations have been developed in Florida, North Carolina, Georgia, West Virginia, Pennsylvania, Connecticut, New Hampshire, Michigan, Illinois, Tennessee, Arkansas, Alabama and Oklahoma.

All of these organizations, as well as other associations previously existing, are being aided by the National Automobile Chamber of Commerce as part of its truck educational campaign. In most of these states, field representatives of the National Automobile Chamber of Commerce have spent from one to several weeks actively working with the new organizations.

The Chamber's campaign contemplates continued and expanding aid to the truck associations, assisting them in building up membership not only of haulers for hire, but of representatives of all industries which own trucks and which are dependent upon highway transportation for quick and economical service.

radical proposals as those which appear in Nebraska and one or two other states to raise the gas tax as high as eight cents per gallon. Proposals for increases range all the way from this high point to a half cent in Arkansas and Utah. Proposals for a one-cent increase are being made in Arizona, Arkansas, Connecticut, Iowa, Minnesota, Nebraska, New York, North Dakota, Tennessee and Wisconsin. An increase of two cents is asked in bills introduced in Arkansas, Kansas, Ohio and Tennessee.

Proposed diversions of gas tax receipts from highway purposes have already been introduced in Georgia, Indiana, South Dakota and New York.

Compensation insurance laws, similar to the plan now existing in Connecticut and several other states, are getting consideration in New York, Washington, Wisconsin and several other places.

Compulsory insurance laws of the Massachusetts type are meeting with less favor than ever before, although laws of this general character have been proposed in Kansas, Illinois and South Dakota.

So radical in character are some of the bills being proposed here and there that they scarcely warrant serious consideration as legislative possibilities. Yet the very fact that anybody could consider them seriously enough to introduce them into the House or Senate of a State Legislature is perhaps indicative of how serious a situation might develop unless every force for continuous, effective, educational effort is utilized year after year to paint the proper lines for sound economic and technical regulation and taxation of motor vehicles.

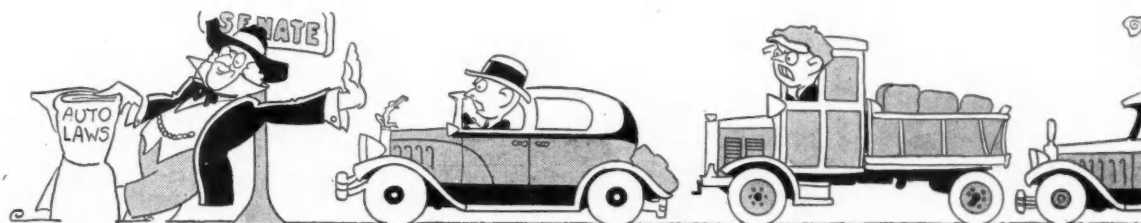
A California legislator, it appears, wants a law that "all vehicles must be equipped with life-saving devices."

In Tennessee arises a proposal that after Jan. 1, 1936, all buses and trucks be compelled to build their own highways. Regulations for the sale of second-hand cars, parts and accessories are asked in Texas. A Wisconsin solon proposes that "when a truck is sold with a promise to the buyer of employment or occupation and later it becomes necessary to repossess the truck, it can only be done by refunding all payments made and relieving the buyer from further obligations."

Nebraska is being asked to consider a law to the effect that the upper half of each motor vehicle headlight must be covered with paint or some other permanent substance.

A proposed Connecticut law would forbid advertising on the outside of passenger cars or on tire covers, when readable more than one foot away; and another idea incorporated in a bill in this same professor-governed commonwealth is that "no employee shall park his car within half-mile of his place of employment for a period exceeding 30 minutes."

Doubtless, the researcher interested in this sort of legislative liverwurst could unearth plenty more samples to delight the taste of Cynics on Democracy. But the important phase of these 1931 legislative developments is the trend toward higher taxation and greater restrictions which they unquestionably indicate. The educational forces of the automotive industry should be marshalled, immediately the current engagement is finished, to work vigorously and continuously between now and 1933 to provide better economic understanding of the meaning and possibilities of motor transportation as a basis for legislative thinking at that time.



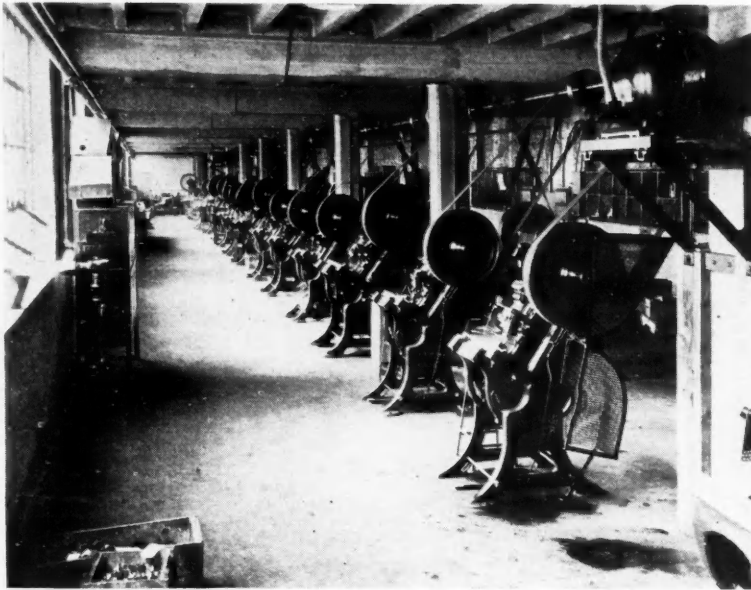


Fig. 1—One section of the press shop of the Mitchell Specialty Co. + + + + +

Maintenance Control and
Refinement in Die Design
at the Mitchell Specialty
Co. Lowers Manufacturing
Costs + + + + +

Knockout Attachment With Safety Guard

IN view of the general tendency to reduce overall costs on automotive products, it is certainly interesting to note the vigor with which costs have been attacked by the parts manufacturer. A typical example of this effort is found at Mitchell Specialty Co., Philadelphia (makers of the Electrolock, door accessories such as dovetails, and car heaters), whose plant we were privileged to study several days ago.

Due to the character of their work, most of the activity is in the press shop, one section of which is seen in Fig. 1. As will be shown later, the chief features contributing to a program of constantly depressing manufacturing costs are refinement in die design and the adaptation of an ingenious safety guard which performs the double function of a safety device and knockout attachment. By means of the latter, production on certain operations has been boosted 200 to 300 per cent.

A reliable index of press shop management is maintenance control and here we found a very simple scheme which practically eliminates breakdown and assures the constant performance of presses. Briefly, they have a small crew which checks every machine and every unit of the line shafting equipment once a week. By this means weak points are spotted and immediately corrected. Another function which the superintendent considers very important is that of general cleanliness tied up with a program of periodic painting up. This gospel of clean, well-painted working surroundings is certainly spreading rapidly, for there is ample evidence on all sides to justify it from an economic point of view.

Technological obsolescence, that is, obsolescence due to the availability of improved methods and machines, is given especial attention because in small parts pro-

duction the fractions of a cent are very important and easily dictate the purchase of new equipment.

To illustrate a typical stamping job, let us examine the dovetail pocket stamping, Fig. 2, which constitutes the framework for the complete dovetail. Considering its small size, this piece requires a relatively large number of operations, as will be evident from the following routing: (1) Blank and form. (2) Trim. (3) Finish form. (4) Pierce two holes. (5) Pierce slot. (6) Notch. (7) Japan. In addition, three other operations are required for the final assembly of the unit. These are: (1) Assemble nuts and retainers on a press. (2) Tap the nuts. (3) Assemble rubber blocks and springs. Now this particular unit happens to be one on which production is relatively moderate. Where large volume is possible, marked savings have been made by using combination dies whose greater initial cost can be readily absorbed. As

a matter of fact, on a similar dovetail frame they use a combination die which eliminates

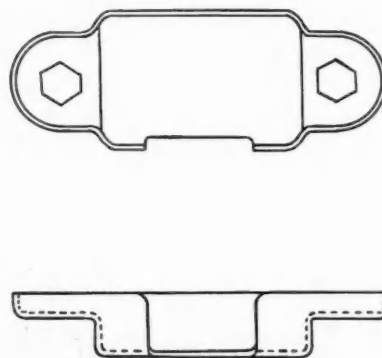


Fig. 2—This dovetail pocket stamping is a typical press shop job + + +

at least four of the initial punch press operations.

A fine example of a combination die which may be of interest to many readers is shown in Fig. 3. It is designed for an Electrolock body and performs six operations at one stroke. As will be evident from the illustration, six pieces are loaded into the die at one time and progressively shifted from mandrel to mandrel until all six operations have been completed. However, one Electrolock body with six distinct operations is completed with every stroke of the ram.

Production men while visiting other plants invariably observe that in each plant some special method of attack is employed in tooling and methods to effect manufacturing economy. At Mitchell the vote-getter is a safety guard (patent applied for) which was designed by the superintendent. A fully dimensioned drawing of this guard is shown in Fig. 4 and its application well illustrated both in Fig. 3 and Fig. 5. Because their press equipment is so nearly alike in type and

up in Fig. 5 the bar is bent and fitted with a small sheet metal projection. Incidentally in Fig. 5 is found an additional safety guard in the form of an apron, shown in the foreground. On another press we observed two bars on the safety guard. The forward bar acts as the safety feature, while the other serves as the ejector. Another effective safety guard installation is found on the small riveting machine, which was hazardous to operate without a guard. The installation of a small knockout bar swinging out in front of the punch, as the punch descended, eliminated the mental and physical hazard to such an extent that production was increased many times over.

Evidently a great deal of thought has been given to the ejector or knockout feature because it increases production materially and eliminates a lot of wear and tear on the dies themselves. We ought to explain this by drawing attention to the fact that without an adequate ejector small stampings sometimes jam in the die and cause breakage. One interesting design feature of the ejector is that the punch is arranged to lift the piece on the up stroke so that it may be knocked off by the ejector.

Another efficient form of ejector is the air nozzle attachment which the company uses wherever the safety guard is not needed and sometimes to supplement the safety guard. The best place for this device seems to be on small parts stamped from a continuous strip. By actual count, production was increased almost 300 percent by the addition of this feature. There is nothing elaborate about the arrangement except that each press is provided with an individual air line connection so that a hose and nozzle

may be attached and brought over to the press whenever desired. Generally the nozzle has some simple arrangement for holding it open while the press is running. No doubt, some simple automatic arrangement could be employed, but this would hardly help

Boosts Press Production

capacity, the safety guard is interchangeable on all presses and variations due to differences in stroke or differences in the function of the knockout device are compensated by using the right sets of holes in the guard flanges. As mentioned earlier, the safety guard performs a double function, acting not only as a safety device but also as a knockout or ejector. In operation, on the down stroke, the safety guard bar swings out. On the up stroke, the bar swings in and ejects the work.

By comparison of actual production figures, output has been increased to 200 per cent and in some cases 300 per cent of previous performance by the introduction of the guard. Not all the reasons for this are evident on the surface. And although the knock-out feature is responsible for a large part of the increase, a lot of credit goes to the psychological factors involved. Let us make this plain. Without a suitable safety guard, the operator tends to hold back because of the mental hazard involved; with a safety guard which has demonstrated its real value, the mental hazard is entirely removed and the operator can be keyed up to any desired speed within reason, the maximum value of the speed being influenced by the efficacy of the ejector feature.

A number of interesting variations are found in the ejector depending upon the nature of the job. For example, in Fig. 3 a straight bar is employed. On the set-

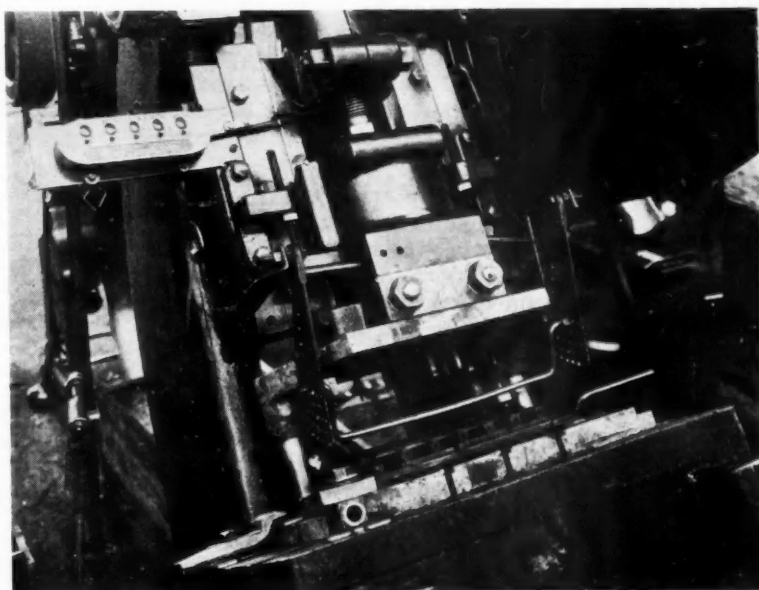


Fig. 3—A fine example of a combination die

by
Joseph
Geschelin

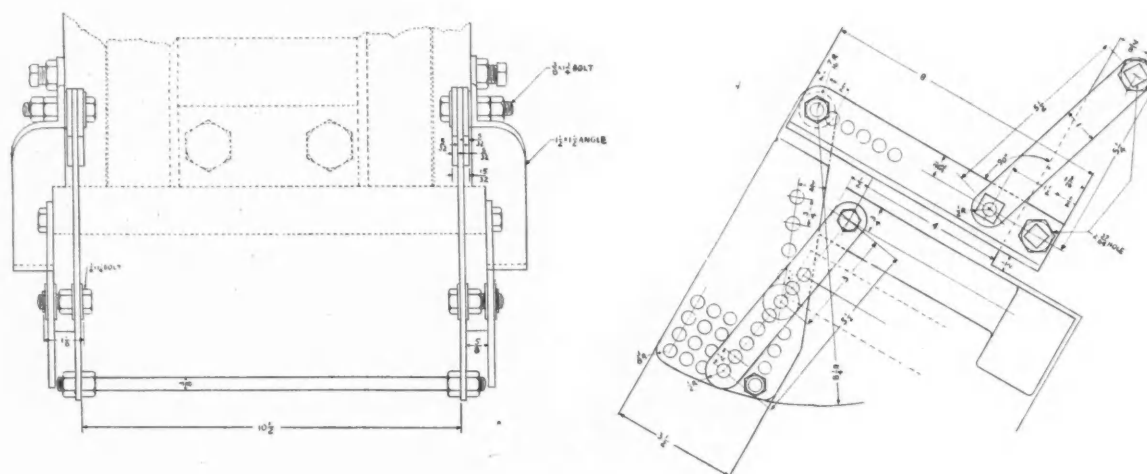


Fig. 4—Detail drawing of the safety guard and knockout attachment

increase production and might interfere with the unusual flexibility of the present scheme.

Now here is a real "kink." Frequently press operation is seriously hampered by the difficulty of loading and unloading small pieces under the ram, an example of this being a small metal underwriter's label which is individually coined here. They lick this problem by reciprocating the holding fixture under the ram by means of a toggle linkage connected to the ram. Normally, with the ram up, the fixture is out in front where it may be easily and rapidly loaded. On the down stroke, it is brought directly under the ram and on the return stroke again carried to the front, where it is quickly unloaded and reloaded. By this simple device the press has been speeded to its limit.

What about inspection? This is very important and materially affects cost. Actually under the scheme at Mitchell, inspection is a relatively simple but effective proposition. First of all, as is customary, the initial set-up is made and checked by tool setters. Then the operator of each machine is provided with a master gage to check the controlling dimensions of the work so that the regular use of this gage provides a running check on the set-up. However, the important detail is that the dies are designed to be self-checking from operation to operation by providing them with suitable locating points. Any variation in important dimensions will prevent the piece from properly entering the die on the next operation. It is quite evident that this set-up assures accuracy with a minimum of inspection. Naturally, there is a final inspection on all finished parts before they are shipped to the customer.

While on the subject of inspection, it is well worth while mentioning the simple inspection hood which has been provided for inspecting the quality of nickel and chrome plate finish. It is in the form of a box open at one end with an inclined top provided with a piece of coated glass. This is set near a window to get daylight and under the diffused light imperfections in the plating are readily seen. For best results the glass might be coated with a piece of tracing cloth, as this will impart a slightly bluish tint to the diffused daylight. A more elaborate inspection hood was described in the Production Issue of *Automotive Industries*, page 512, Oct. 12, 1929.

Summarizing briefly, those interested in press shop operations may find it very profitable to study this interesting safety guard and ejector application. As a matter of fact, we are told that the utility of this

device is so marked that it has attracted the attention of a number of safety engineers, including those from the Safety Departments of several neighboring states. The simplicity of the air nozzle ejector may also find considerable application and may be profitably employed on many high-speed press installations.

As in other industries, research has an important place here. In fact, only those actively engaged on the job can appreciate the actual amount of research involved in the development and improvement of such parts as a dovetail or ignition lock. As a matter of fact, development of the dovetail is intimately tied up with body design and is found to be an essential factor in the latest activities along the lines of body silencing.

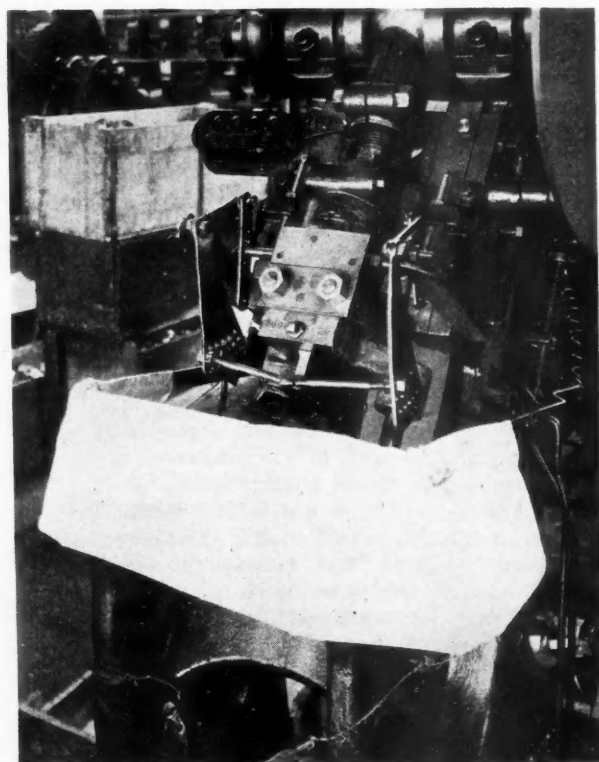


Fig. 5—The safety and knockout attachment is shown here with an additional safety feature in the form of an apron

HOW'S BUSINESS?

GOING TO BE THIS MONTH.

CHARTED BY UNITED BUSINESS PUBLISHERS, Inc.

THIRTY-FOUR ECONOMIC EXPERTS—EDITORS OF BUSINESS PAPERS PUBLISHED BY THE *United Business Publishers, Inc.*—HERE PRESENT A COMBINED OPINION ABOUT THE COURSE OF BUSINESS DURING THE MONTH OF MARCH, GOVERNMENT AND OTHER RECORDS PROVIDE YOU WITH HISTORY OF RECENT MONTHS. THIS BOARD OF EXPERTS DEALS ONLY WITH THE FUTURE. ITS OPINIONS ARE BASED ON CLOSE CONTACT WITH THE MORE THAN 400,000 SUBSCRIBERS REACHED BY THEIR PUBLICATIONS IN FAR FLUNG FIELDS OF RETAILING AND INDUSTRY.

We approached last spring largely with over-confidence. The approach this year is with a more fitting caution.

December now appears as a buoy marking the shallowest water. Soundings taken on such dependable indices as steel production and bank credits are continually more encouraging, and able navigators report quite confidently that we have crossed the bar. There is certainly a more favorable behavior in many trend lines that, when seasonal change is subtracted, gives a substantial optimism with which to temper our caution. Deeper water and fair sailing ahead seem assured.

That we will lag behind last year's production and consumption in certain lines during the

opening months, or even the first half of the year, is quite generally agreed. But that we are moving forward, and at the same time up, is the assurance that will replace caution with confidence.

This is a year in which new reputations will be made. There promises to be one of the greatest shufflings of business cards ever witnessed, and the prizes will go to the concerns who have the wind and the stamina to stage an aggressive sales program. The buying public has moved ahead in tastes and needs, and price cutting as an expedient will be buried and forgotten in the activities of the concerns with the foresight to bring out new product leaders and exploit them with live, up-to-date sales promotion plans.

THE COURSE OF BUSINESS FORECAST FOR MARCH

BUSINESS	SALES	RETAIL STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	Estimated sales of passenger cars 60% greater in March than in Feb., and 27% less than Mar. '30. Trucks 30% greater and 17% less respectively.	Passenger car stock will show seasonal increase, and trucks greater than seasonal increase in March. Both lines materially behind Mar. '30.	About the same in March as in February but slower than Mar. '30.	March passenger car sales are estimated at 225,000. Truck sales between 30 and 40 thousand.
DEPARTMENT STORES	March sales 10% ahead of Feb., but 5% less than Mar. '30.	No change in retail stock from February—but 7% below Mar. '30.	Same	March stocks, though less in value than a year ago, will be larger in units.
HARDWARE	Approximate increase of 12% over Feb., and about the same or slightly better than Mar. '30.	Retail stocks about 15% heavier than in February—but 10% below Mar. '30.	Slight improvement in March over February—but slightly below Mar. '30.	Substantial size of orders for Spring goods reveals very little carryover of this type of merchandise from last year.
INSURANCE	Slightly better in all lines in March. About the same in life, with improvement in other lines over Mar. '30.	.....	Slight improvement in March, and easier than Mar. '30.	Optimistic spirit pervades the agency organization of the entire country.
JEWELRY	The same or slightly better than February, and possibly better than Mar. '30.	Same in March as in February—and about the same as Mar. '30.	Same or better than year ago with cash jewelers. Installment house collection dependent upon employment situation.	The jewelry business generally is beginning to look up again.
METALS METAL PRODUCTS MACHINERY	Steel industry should show a further slight gain in operations in March.	Machine tool orders, a fairly good index of manufacturing activity, turned upward in Jan.	.....	Indications are that business will continue to be spotty for some time to come.
PLUMBING AND HEATING	Slight improvement in March over February—but below Mar. '30.	Stocks about the same in March but below Mar. '30.	Collections improved due to volume of work being placed on regular deferred payment basis.	.....
SHOES	About 25% increase on Spring shoes, 10% increase on old stocks in March. Decrease of 10% from Mar. '30.	Declining—two pairs sold for every pair incoming. About 12% below Mar. '30.	Collections slowing up. When discount is no incentive, collections fall.	All eyes of the industry are focused on an anticipated selling "bulge" in March.

Anti-Friction Bearings Demand Clean

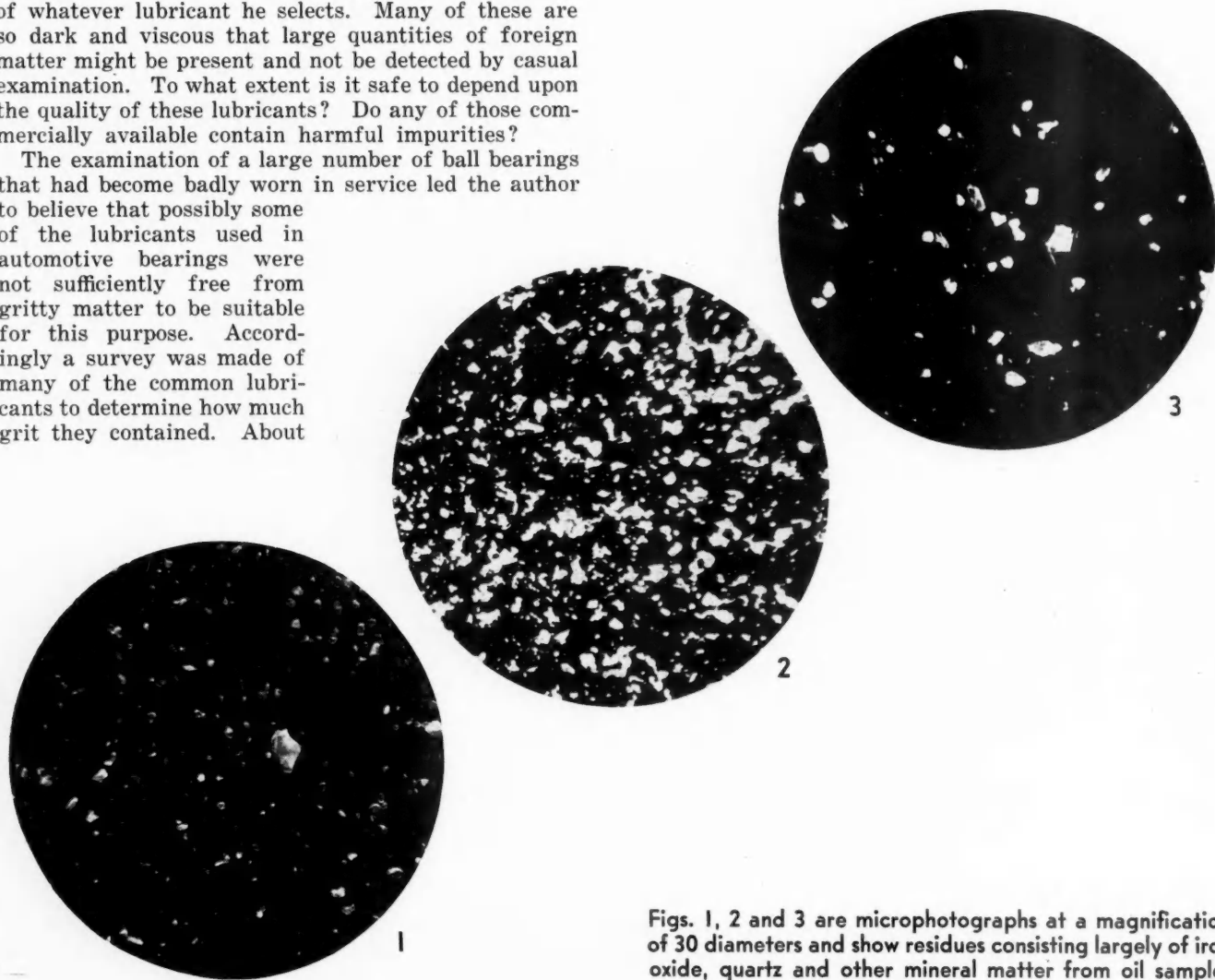
Samples of numerous commercial lubricants were tested and compared with those on an artificially contaminated specimen for dirt content

THE manufacturers of anti-friction bearings continually emphasize the absolute necessity of keeping grit out of this type of bearing to insure normal service. They recommend that new bearings be kept wrapped until they are installed. In repair work the bearings should be thoroughly washed in *clean* gasoline, coated with oil to prevent rust, and protected from dust and dirt until they are returned to the assembly. Washing a bearing in dirty gasoline is likely to do more harm than good. It is also recommended that a good grade of lubricant, free from gritty material, be used. But here the mechanic cannot guard against grit as he can in the other cases, since he has no means of determining whether or not the lubricant is clean. He must depend upon the quality of whatever lubricant he selects. Many of these are so dark and viscous that large quantities of foreign matter might be present and not be detected by casual examination. To what extent is it safe to depend upon the quality of these lubricants? Do any of those commercially available contain harmful impurities?

The examination of a large number of ball bearings that had become badly worn in service led the author to believe that possibly some of the lubricants used in automotive bearings were not sufficiently free from gritty matter to be suitable for this purpose. Accordingly a survey was made of many of the common lubricants to determine how much grit they contained. About

40 samples, representing nearly as many refineries, were obtained. These were purchased in the open market as 1-gal. samples in most cases, and they came from all parts of the United States, with two from Canada.

Only small amounts of dirt were expected, so a method of analysis was used which permitted handling a fairly large sample. The dirt was separated from the oil by dissolving the latter in large quantities of a mixture of gasoline and benzine, allowing long periods for the dirt to settle before siphoning off the supernatant liquid. The residues were finally extracted with chloroform and ether, to remove asphaltic and other organic matter not dissolved by the gasoline-benzine



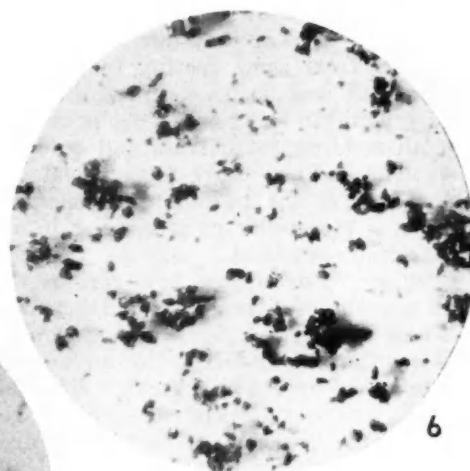
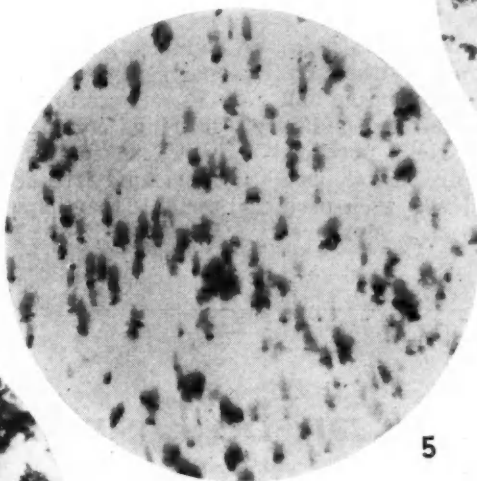
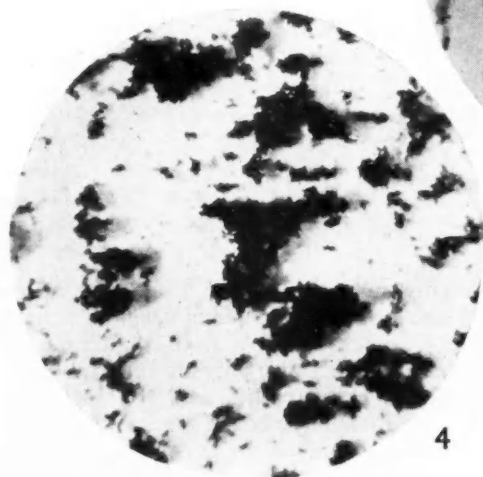
Figs. 1, 2 and 3 are microphotographs at a magnification of 30 diameters and show residues consisting largely of iron oxide, quartz and other mineral matter from oil samples

Lubricants

By

Leland E. Grant

Formerly Chief Chemist
New Departure Mfg. Co.



Figs. 4, 5 and 6 show residues as they appeared after the burning-off process to remove all non-gritty material + +

mixture. Finally the dirt was gently ignited in a platinum dish to burn off any carbon remaining, as it was not thought that the carbon should be considered as gritty matter. The dirt remaining was carefully weighed.

The residues consisted largely of iron oxide, quartz and other mineral matter. Extraction of the iron oxide brought out very clearly the gritty nature of much of the residues. Photographs of some typical residues treated in this manner are shown in Figs. 1, 2 and 3 at a magnification of 30 diameters. Some residues as they appeared after the ignition are shown at the same magnification in Figs. 4, 5 and 6. That material such as is shown in Fig. 1 is harmful cannot be doubted. The sharp quartz particles are very abrasive.

Detailed results on the individual oils cannot be given, but the following summary gives the essential facts brought out in the investigation:

Dirt content less than 0.010%	16 samples
Dirt content between 0.010 and 0.030%	12 samples
Dirt content between 0.030 and 0.080%	8 samples
Dirt content between 0.080 and 0.100%	2 samples
Dirt content more than 0.10%	1 sample

If one accepts the limit of 0.03 per cent residue as a maximum for foreign matter, it is evident that a majority of the lubricants may be expected to be satisfactory. There are enough of them, however, which contain harmful amounts of dirt to indicate that some care should be taken in selecting lubricants for anti-friction bearings.

As an extreme we may take the case of the lubricant which had more than 0.10 per cent dirt. It actually contained 4.26 per cent foreign matter, of which over 50 per cent was finely divided silicious material. Such a lubricant is fit only for the roughest sort of lubrication.

The question naturally arises as to whether or not lime-soap greases contain more grit than the transmission oils. These, of course, are used extensively for lubrication of anti-friction bearings. The author's experience in the examination of a large number of greases has been that they contain but very little grit, seldom more than 0.010 per cent. In any event, a small amount of abrasive matter in a grease is less serious than it is in an oil. The grease is so immobile in a large number of applications that only a small amount of that present ever comes into contact with the metal of the bearing. In the case of an oil, the dirt is kept moving more or less continuously with the lubricant, and can do much more harm.

Sometimes in the examination of worn bearings one may wrongly blame the oil as the source of the abrasive

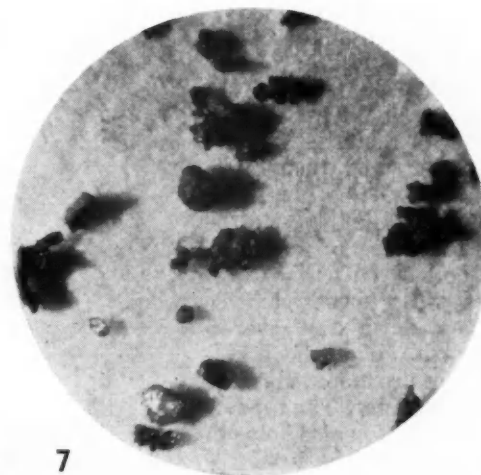


Fig. 7 is dirt washed from a failed bearing + +

matter. Fig. 7 shows some dirt washed from a failed bearing. It is clear that this sand was not in the oil, but came from some casting in the assembly where the bearing was used. Grit of this nature will lap out a bearing in short order. It is absolutely essential that all molding sand, scale and oxide from welding operations and any other foreign material be entirely removed from the units of any assembly in which there is a possibility of it coming into contact with anti-friction bearings.

In order to determine how serious the effect of a small amount of abrasive in a lubricant would be, a test was made using very fine alundum as the grit. This was thoroughly mixed into melted petrolatum and kept mixed by rotation of the container during solidification. Analysis of samples from various portions confirmed the homogeneity of the mixture and showed 0.05 per cent alundum. This material was then used for the lubrication of some ball bearings. Measure-

ments before and after running in this lubricant showed very rapid wear, far too great for the bearings to have given satisfactory service in any machine. It should be borne in mind that the 0.05 per cent alundum was all abrasive matter, while only a part of the dirt in the lubricating oil is abrasive. Also, the very fine alundum probably is a much better abrasive than much of the dirt present in the oils.

There can be little question from the above results that the limit of 0.03 per cent ignition residue is at least as high as should be permitted. Many of the samples examined showed as little as 0.002 and 0.003 per cent residue, so that it seems to be practical for the refiners to produce an oil suitable for anti-friction bearings containing but little foreign matter. Those who use many bearings of this type should have lubricants free from harmful quantities of gritty material if they hope to receive normal service from their bearings.

Kinner Aircraft Engine Can Be Dismounted Without Disconnecting Accessories

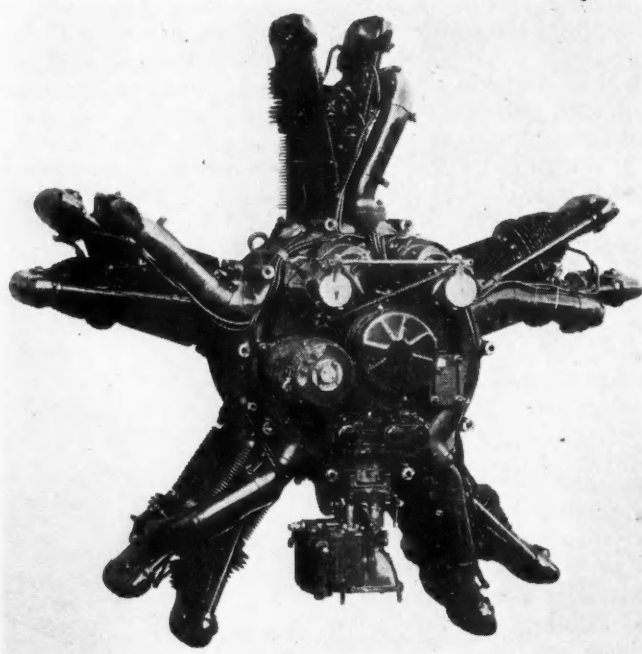
APPROVED-TYPE certificate No. 62 was granted recently for a new five-cylinder radial air-cooled aircraft engine of the Kinner Airplane & Motor Corp., Los Angeles, Calif., the C-5. It develops 210 hp. at 1900 r.p.m. and weighs 420 lb. without propeller hub, carburetor, air-heater, exhaust collector ring, starter, electric generator and fuel pump. Its specific weight therefore is 2 lb. p. hp., which compares with 2.36 lb. for the B-5 and 2.75 lb. for the K-5, the two earlier Kinner engines of the same general type, which, however, are of smaller size than the C-5.

The new engine has a bore of $5\frac{5}{8}$ and a stroke of $5\frac{3}{4}$ in., so that its displacement is 715 cu. in. The compression ratio is 5.25 to 1. Ignition is by two Scintilla magnetos. A Stromberg NA-R7 or a Holley 439 carburetor is supplied at the option of the purchaser. The overall diameter of the engine is 50 in. and the overall length, without starter and generator, 34 $\frac{13}{16}$ in. Owing to the small length and the radial type of construction, excellent forward visibility is possible. To keep down the overall length, all of the accessories are mounted in the same plane. The type of construction also helps to keep down the head re-

sistance by allowing of free air-flow about the nose.

No rotary diffuser or supercharger is used, all accessories are driven by spur gears, and the "plumbing" is held to a minimum, consisting only of the "in" and "out" oil lines, the oil pressure line and the fuel line connections. While provision is made for a fuel pump, the carburetor is so located as to permit of considerable latitude in the location of the fuel tank and even to permit of the use of gravity feed if desired.

An innovation for Kinner is the provision made for the mounting of a standard starter, a generator, and a fuel pump. The drive for the generator is incorporated in the engine. All of the accessories are inside the engine mounting circle, which is 19 $\frac{1}{4}$ in. in diameter, and are therefore readily accessible and subject to thorough inspection. In dismantling the engine, all accessories come away with it without being disconnected. The carburetor is the only accessory which is mounted ahead of the plane of the mounting circle. The engine can be used either as a tractor or a pusher, a deep-grooved ball-type thrust-bearing being provided to carry crankshaft thrust loads.



Rear view of Kinner 210 hp. engine, equipped with all accessories for the mounting of which provision is made + + + + + + + + + +

Thermostatic Control of Crankcase Oil Is a Much-Needed Development

by Dr. A. E. Becker

Standard Oil Development Company

The relation of friction hp. to starter hp. and engine power at low speeds is the real controlling factor in starting internal combustion engines at low temperatures

IN starting an internal combustion engine three things are necessary:

1. The engine must fire readily.
2. When firing occurs the engine should continue to operate without further resort to the starter.
3. Good lubrication must be provided to all parts of the engine immediately.

It would be just as easy to accomplish these things at low temperatures by suitable choice of fuel and lubricant as under summer conditions were it not for the fact that very soon after the engine is started both fuel and lubricant must function under engine operating temperatures similar to those which exist during warm weather. This is particularly true as regards the lubrication of the cylinder walls. It is therefore necessary to select fuels and lubricants which represent a practical working compromise between these diverse requirements and to resort to such starting tricks as may be necessary.

It is obvious that the accomplishment of (1) and (2)—the firing and continued operation of the engine—depends upon a number of factors. Every operator realizes that it is essential to maintain the starter in good condition, a fully charged battery, properly set distributor breaker points, a first-class coil and ignition system, and good spark plugs with correct gap setting. A winter gasoline of good volatility should be selected, although we shall see that there has been some tendency to overestimate this factor in the past. On the other hand, it will be equally obvious that it is essential with present-day engines and starter equipment to carefully select crankcase oils for winter operation, due regard being had to the dilution fac-

tor. This latter is largely a question of fuel used, carburetor and manifold design.

The accomplishment of (3)—the cold lubrication of the engine—depends entirely upon the crankcase oil having proper physical

characteristics. We shall see that the pumping of the crankcase oil to the bearings and its delivery by spray to the cylinder walls depends as much upon its viscosity at the crankcase temperature as upon the more generally accepted pour-point criterion. This part of the paper will also show that the tendency toward thermostatic control of crankcase oil temperatures is a much-needed step in the right direction.

Effect of Friction Horsepower on Cold Starting

In an attempt to evaluate the factors mentioned, a series of dynamometer experiments were made the latter part of 1928 with a large poppet valve

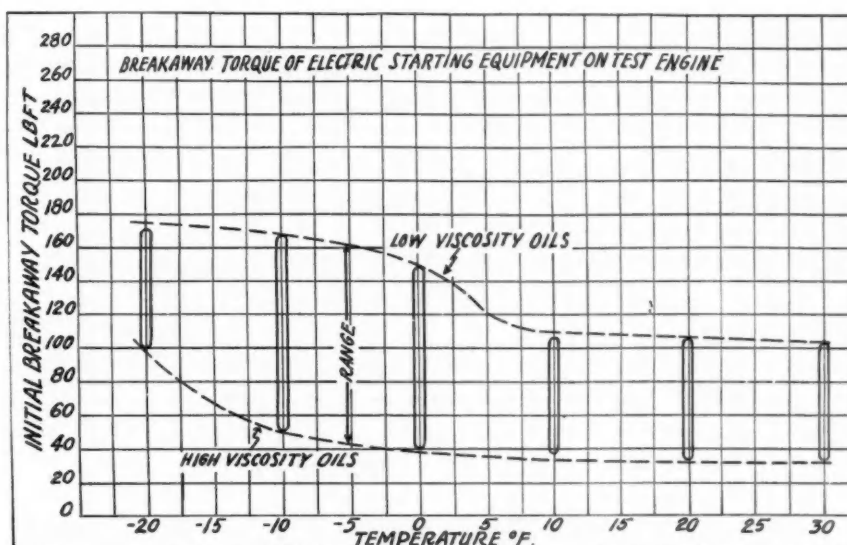


Fig. 1—Breakaway torque requirements

Paper presented to the New England Section of the S.A.E. slightly condensed.

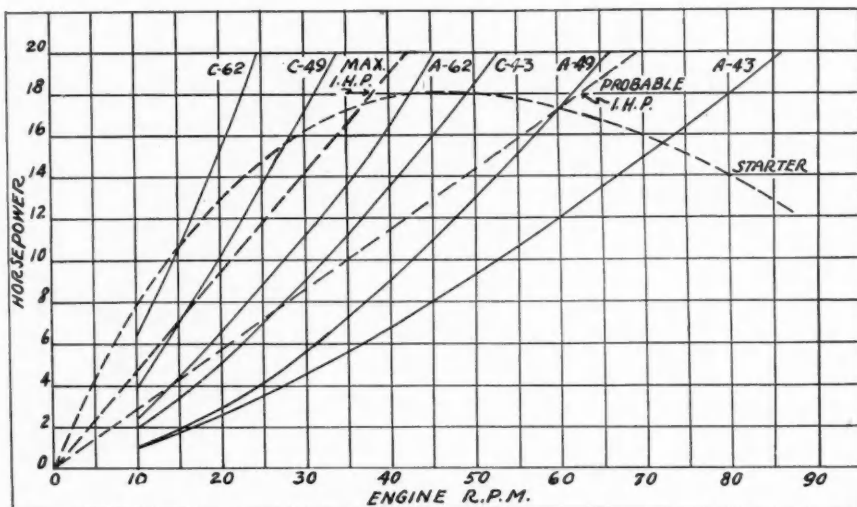


Fig. 2—Starting-power requirements with oils at 10 deg. Fahr. (bus-type engine) + + + + + + + + + + +

bus engine and a sleeve-valve passenger car engine, both of the six-cylinder type. Both had been operated the equivalent of several thousand miles before being used in these tests, insuring well run-in bearings. Each engine was mounted in a cold room and coupled to an electric dynamometer on the outside.

In conducting a test on a given motor oil, the engine was first cleansed with same. Following this it was set on top dead center on the compression stroke of No. 1 cylinder. It was then cooled to a low temperature during the night, say to minus 20 deg. Fahr. The following measurements were made next morning, after making certain that all parts of the engine and room had attained temperature equilibrium:

1. Initial breakaway torque.
2. Several secondary breakaway torques taken at four-minute intervals.
3. Motoring torques and speeds up to 150 r.p.m. (where possible) on a fixed time schedule.

The engine was then reset at top dead center on the compression stroke of No. 1 cylinder, and the temperature of the test room and engine was raised to minus 10 deg. Fahr., whereupon the same observations were made as before. This procedure was repeated at 10 deg. Fahr. intervals up to 30 deg. Fahr. All test temperatures for a given oil were completed in one 16-hour day.

About thirty lubricants were tested in each engine. The significant physical constants of the oils under discussion are as follows:

Oil	Pour Point Deg. F. @ 100	Saybolt Visc. Deg. F. @ 210	Saybolt Visc. Deg. F. @ 210
A-43	35	158	44
A-49	30	236	49
A-62	25	474	64
B-49	0	298	49
B-62	0	603	62
C-43	0	205	44
C-49	0	361	50
C-62	0	755	61

In Fig. 1 are shown the initial breakaway torque data for all of the oils tested. The secondary breakaway torque in each case was less than the initial breakaway torque. Contrary to the usual conception, the lock torque of the electric starter equipment (262 lb.-ft.) was far in excess of the highest breakaway torque requirement even at 20 deg. Fahr. However, as we shall see presently, the power requirements increase rapidly with speed, so that with some oils it would be impossible to obtain a speed of even 1 r.p.m. at zero and sub-zero temperatures, due to the shearing force required for viscosities which such crankcase oils have at low temperatures. Consequently, true breakaway effort is really unimportant. Incidentally, it should further be noted that the high-viscosity oils

actually break away more readily than those of low viscosity.

In Figs. 2 and 3 are shown friction h.p. curves for the several oils listed, as obtained at 10 deg. Fahr. Maximum i.h.p.'s were calculated by assuming an i.m.e.p. lb. p. sq. in. of 90. For purposes of discussion probable i.h.p.'s of 60 per cent of the maximum calculated are assumed to exist under cold-starting conditions.

Referring to Fig. 2, it will be seen that at a temperature of 10 deg. Fahr., a starter speed of 72 r.p.m. is possible with crankcase oil A-43, as compared to a speed of 15 r.p.m. for C-62. It is obvious that starting can be much more readily accomplished with the former oil than with the latter.

However, the A-43 oil would be of too low viscosity for winter service in this bus engine. The use of the C-62 oil may bring about an impossible starting situation. The starter can attain only a speed of 15 r.p.m. when the crankcase is filled with a new charge

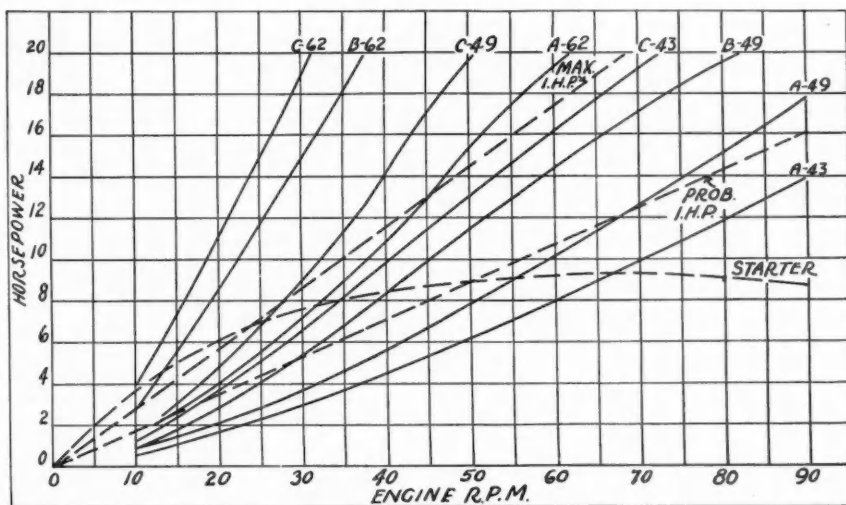


Fig. 3—Starting-power requirements with oils at 10 deg. Fahr. (passenger-car engine) + + + + + + + + + + +

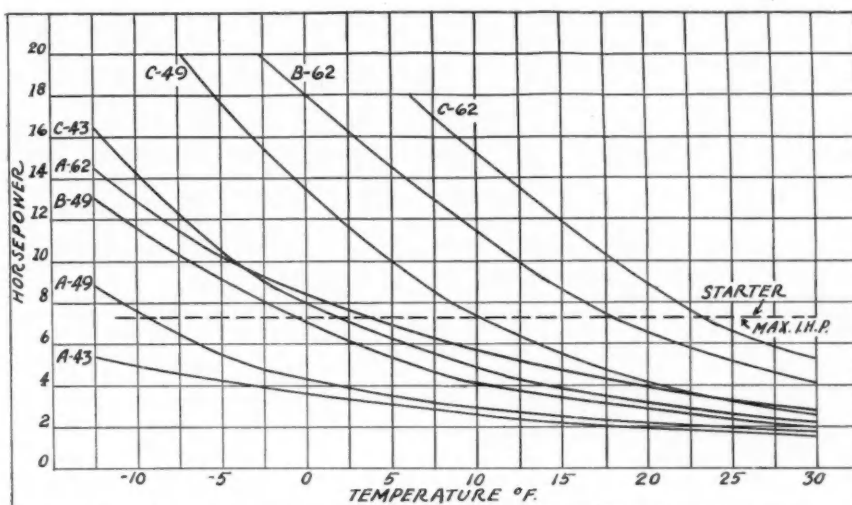


Fig. 4—Starting-power requirements at 25 r.p.m. and different temperatures + + + + + + + + + +

of the latter. Should firing result, the maximum i.h.p. curve shows that there would not be enough power generated to overcome the friction h.p. at this speed and temperature. The first explosions would probably cause the operator to release the starter but would fail to generate enough power to carry the engine at the minimum firing speed.

Referring now to Fig. 3, it will be seen that the A-43 f.h.p. curve lies slightly below the probable i.h.p. curve throughout the speed range shown. Therefore, if the engine fires with this oil in the crankcase, sufficient power will be generated to accelerate it with each succeeding cylinder that fires.

The seriousness of the situation becomes apparent when the probable i.h.p. curves are studied in relation to the various f.h.p. curves shown. Fortunately, conditions are materially improved as soon as the new charge of oil has been used a short distance, due to decrease in viscosity caused by dilution.

In Fig. 4 the eight oils we have been discussing are compared at a constant speed of 25 r.p.m. It happens that the calculated maximum i.h.p. and the starter hp. are the same for this engine at 25 r.p.m. Thus, if we assume, for purposes of discussion, that a speed of 25 r.p.m. is required for firing, the starter hp. line indicates the respective temperatures at which the several oils will behave identically. There is a temperature advantage of 33 deg. Fahr. for A-49 over C-62.

At 50 r.p.m. the calculated maximum i.h.p. is considerably greater than the starter hp., and if firing occurs at such speeds the engine has the possibility of developing more power than required for overcoming the friction hp., with the result that it accelerates and continues to fire. Temperature differences between various oils are about the same at 50 r.p.m. as at 25 r.p.m.

Figs. 5 and 6 show the effect

of dilution. Every operator realizes that the crankcase oil is quickly diluted by frequent use of the choke and short runs. Under average winter conditions, considerable dilution occurs within 50 miles after charging the crankcase with new oil, and dilution equilibrium is attained within 100 to 150 miles. An examination of the two figures shows that a certain amount of dilution is a great starting aid, in that it reduces the hp. required to overcome the friction at low temperatures. For example, Fig. 5 shows that the friction curves for A-49 at 10 deg. Fahr., A-49 + 5 per cent dilution at 0 deg. Fahr., and A-49 + 15 per cent dilution at -10 deg. Fahr. have the same relative position with respect to the probable i.h.p. curve and cut the starter curve at about the same

r.p.m. Or from Fig. 6 it will be noted that the starter can attain a speed of 25 r.p.m. with C-49 at 10 deg. Fahr., with C-49 + 5 per cent dilution at 5 deg. Fahr., or with C-49 + 15 per cent dilution at -5 deg. Fahr.

From Fig. 6 it is probable that no particular starting problem with either A-49 or C-49 oils or with intermediate oils of the same viscosity class would be experienced after 50 miles use in cars which require only 25 r.p.m. to obtain firing when temperatures as low as 5 deg. Fahr. are encountered. If a speed of 50 r.p.m. is required to cause firing then the C-49 oil would cause starting difficulties at 10 deg. Fahr. even though it had been operated long enough to contain 15 per cent dilution. However, there are few cars which require such high speeds to start them.

Thus a partial solution of the starting problem is to use very low viscosity oils or to accomplish the same thing by either prediluting higher viscosity oils or permitting the latter to rapidly dilute in

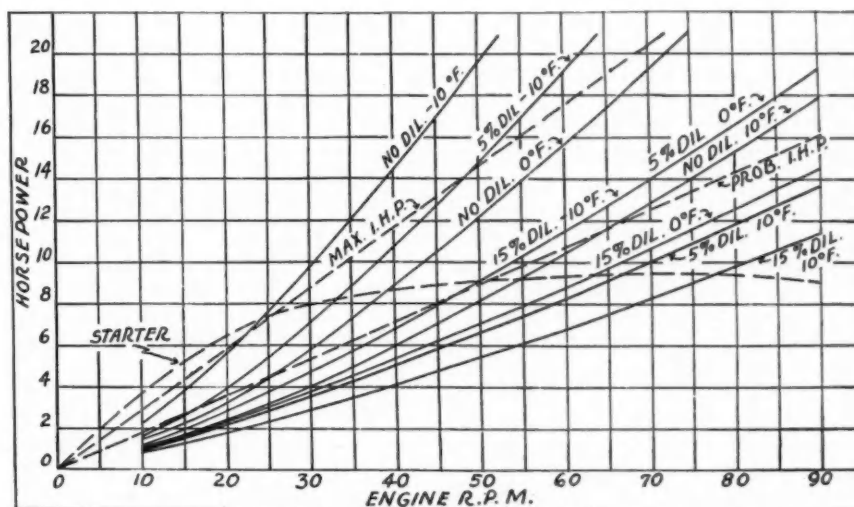


Fig. 5—Starting-power requirements with oil A-49 when diluted, at different temperatures + + + + + + + + + +

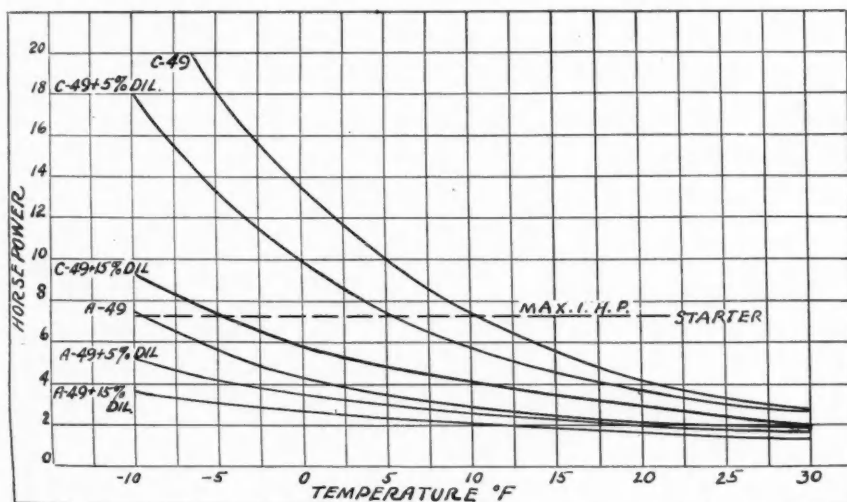


Fig. 6—Starting-power requirements with diluted oils at 25 r.p.m. and different temperatures + + + + + + + + +

service. However, diluted oils are not desirable after the engine is warmed up. This immediately suggests a favorite trick used before self-starters were in general use, namely, stopping the engine with the choke. By so doing the gasoline sucked into the various cylinders will dilute the oil on the cylinder walls, thereby reducing the starting effort required next morning without excessively diluting the crankcase oil. As a matter of fact, such procedure really reduces the amount of choke required the following morning. In stopping the engine by this method, it should first be idled and then stopped by pulling out the choke. After this operation is completed the ignition should, of course, be shut off to avoid discharging the battery. This method is not proposed as an ideal solution, but merely as a practical means in cases where other methods cannot be employed.

Car Starting Experiments

During the past two years we have conducted starting tests of a quite different character than the experiments just described. Some thirty cars and trucks of various makes and designs have been placed in a large cold room where the temperature could be controlled and maintained at definite points. In making such tests the crankcase was charged with the oil to be tested. The engine was operated on its own power until the crankcase oil temperature reached 100 deg. Fahr. It was then stopped by cutting off the gasoline supply, so as to prevent dilution of the oil on the cylinder walls and thus make it easier to duplicate the starting conditions. Battery, ignition and starter were examined to make certain that they were in first-class condition. The car and room were cooled over night to a low temperature, say 0 deg. Fahr. Using a winter

grade gasoline the procedure the next morning was as follows:

1. With the clutch held out the starter button was depressed for ten seconds or until an explosion occurred, the choke having been applied to best advantage as determined from previous starting tests.
2. In case firing did not occur the cycle was repeated after a lapse of twenty seconds. This procedure was continued until the engine started, or to a maximum of nine attempts.
3. Actual revolutions of the engine at each attempt were obtained.

At the conclusion of these operations the engine was started (by the rear-wheel dynamometer if necessary) and run until the crank-case oil temperature reached 100 deg. Fahr. Car and room were then raised to the next test temperature and the procedure repeated.

Fig. 7 shows the results with several cars so tested, No. 1 having four cylinders; 2 and 3, six cylinders, and 4 and 5, eight cylinders. In obtaining each of these curves, various motor oils were used at several crankcase temperatures. The volatility of the fuel used was not found to be the determining factor in cold starting, as each of these cars was started readily at any temperature, providing the respective starter speeds obtained were higher than the minimum indicated on each curve.

It is evident at a glance that there is a tremendous difference in the starting ability of different cars. For example, it is permissible to use an oil of as much as 80,000 sec. Saybolt viscosity at the starting temperature in car 1, yet in cars 4 and 5 trouble would be encountered if the crankcase oil viscosity were higher than 25,000 sec. Were all cars as easy

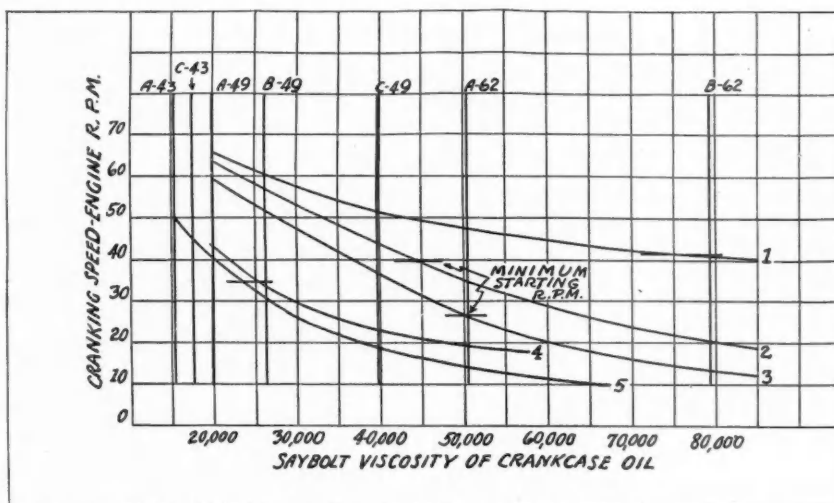


Fig. 7—Cold-starting requirements of five test cars with various oils at 10 deg. Fahr. + + + + + + + + +

to start as No. 1, winter difficulties would be minor. For comparative purposes the position of the several oils we discussed in the earlier part of this paper have been indicated on Fig. 7 for a temperature of 10 deg. Fahr. These curves give an idea of how the choice of lubricant affects the cold weather starting of the several cars considered.

Cold Engine Lubrication

As stated previously, not only is it important to get a car started in winter weather, but it is absolutely essential to provide the moving parts of the engine with adequate lubrication as soon as a start is obtained. The problem is aggravated in that it is necessary to dilute the oil on the cylinder walls by using the choke in order to obtain the necessary cranking speed to permit starting. The crankshaft and connecting-rod bearings must be supplied with oil by the pump, and in sufficient quantities that there will be a spray from these bearings to the cylinder walls. These things are difficult to accomplish, because of the extremely sluggish flow of lubricants at the low temperatures which prevail in the crankcase in mid-winter.

Using the same oils as in the dynamometer engine starting tests, some pumping experiments were made with a standard Cadillac submerged type oil pump. It was connected to feed a main and a connecting-rod bearing. The assembly was mounted in one of the cold rooms. The oil pump was driven through a transmission by a 3-hp. variable-speed electric motor.

A charge of 12,500 cc. of the oil to be tested was used, bringing the oil level to $6\frac{1}{2}$ in. from the bottom of the sump, the head on the pump being 5 in. of oil. The pump pressure-relief valve was set at 50 lb. gage.

The test was begun by cooling to 25 deg. Fahr. If no lubrication was established at the bearings at this temperature within 5 min., the test on this oil was concluded. If lubrication was established, the necessary readings were made. The temperature was then reduced by steps of 5 deg. Fahr., with readings at each step. Characteristic data are shown in Fig. 8, where the temperature of the oil in the sump is plotted against the time for the oil to reach the connecting-rod bearing.

Comparison of the curves for A-49 and C-49 shows that there is little difference between these oils as regards pumping ability, despite the fact that the former has a relatively high pour point and the latter considerably higher viscosities than the former at corresponding low temperatures. It will be noted further that for both A-62 and C-62 the time to reach the bearing increases rapidly with decrease in temperature. No doubt in the first case this is largely due to the high pour point in conjunction with fairly high viscosities at these low temperatures. It is equally obvious that the sluggishness of the C-62 oil is entirely due to the rapidly increas-

ing viscosity with decrease in temperature, since this oil has a zero pour point but a relatively much higher viscosity at any given low temperature than the A-62 oil. That these conclusions are essentially correct is clearly shown by the curve for B-62. This oil has a zero pour point and viscosities intermediate between those of A-62 and C-62 at these temperatures. Thus it follows that both pour point and viscosity are equally important as regards establishing lubrication in a cold engine.

Consideration of the times required to establish flow with these various oils and of the quantities of oil delivered when such flow is established also leads

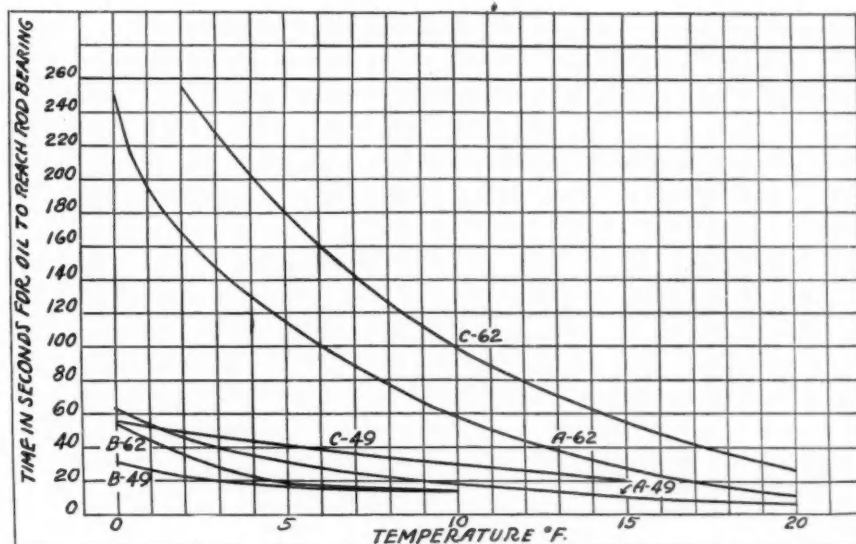


Fig. 8—Cold-pumping characteristics of several oils

to the conclusion that the trend toward thermostatic control of the crankcase oil temperature is decidedly in the right direction. It is just as important to raise the crankcase oil to operating temperatures soon after starting as it is to cool it under severe operating conditions.

These pumping experiments also show that it is desirable to have the overflow from the pressure relief valve discharge as near the pump as design will permit. Under cold conditions the overflow from the pressure relief valve is large and the pressure and movement from the pump render the oil more fluid. Therefore it should be returned to the pump as quickly as possible.

Summary

1. Gasoline of reasonable volatility will permit easy starting, providing other factors are correct.
2. The relation of friction hp. to starter hp. and engine power at low speeds is the real controlling factor. It is important for the manufacturer to so design his engine and starting equipment that as soon as firing occurs the power developed will be sufficient to not only kick out the starter but to maintain operation and rapidly accelerate the engine.
3. The viscosity of the crankcase oil at the starting temperature is of great importance. Regardless of what the manufacturer should do, this viscosity must be low enough to permit the engine as designed to carry the friction load as soon as it fires. Otherwise

(Turn to page 415, please)

JUST AMONG OURSELVES

Automotive Industry Willing to Help Itself

This characteristic trait of the automotive industry and a majority of its executives crops up strikingly in a survey recently made by the Sherman Corp., business and management engineers, to find out what business leaders in various lines think must be done in order to restore prosperity.

Forty-five automotive executives were among the 2304 business leaders who checked a list of twenty factors suggested as possible prosperity-builders and made general comment on the relative importance of the various items. Comparison of the factors considered most important by the automotive men and those which executives in general think need most emphasis is interesting when viewed from the "somebody-else-has-to-do-it" or the "I'll-do-it" standpoint.

Three out of the first four most checked factors in the automotive list are items which would entail active, vigorous effort on the part of individual executives.

The Difference is Between "Who" and "I"

Three out of the first four on the general list are items which require that the government or somebody else than the individual executive do something.

Only on the first one of these four most important factors do the automotive and the general group agree—a majority in both groups seems to think that modification or repeal of the Volstead Act would do more than any other single thing to restore prosperity. A. A. Davis, president, Western Auto Supply Co., voiced what seems to have

been a fairly popular belief among business leaders of all kinds when he wrote to the Sherman investigators:

"Repeal of the Volstead Act would permit a radical reduction of Federal taxes. If our government could collect the revenue on the liquor that is being sold in our country and save the expenses of trying to enforce the 18th amendment we could practically eliminate our Federal income tax."

But it is regarding the next three items that an apparently significant difference appears between the automotive and the general estimates of the importance of factors in bringing back prosperity. Let's put them side by side and

dividual executives in their own plants and organizations.

"Reduction of operating costs," definitely a specific job to be done in each plant, was checked by over 53 per cent of the automotive men who replied. It was checked by only about 43 per cent of the total group replying from all industries.

"Improved manufacturing procedures" were emphasized as prosperity builders by about 47 per cent of the automotive men; but by only 38 per cent of the general group.

"Development of new products," another factor dependent entirely upon individual research, initiative and foresight, was checked as important by 47 per cent of the automotive

Consider Them

2304 Business Leaders

1. Modification of Volstead Act
2. Reduction of taxes
3. Stimulation of public works
4. Revision of sales-merchandising plans

45 Automotive Executives

1. Modification of Volstead Act
2. Reduced operating costs
3. Improved manufacturing procedures
4. Development of new products

Automotive executives, in other words, after voicing their general disagreement with Henry Ford's ideas on prohibition by placing modification at the top of things needed to bring back better economic conditions, turned for the most part immediately to emphasizing factors, the development of which lies almost entirely in the realm of individual effort by in-

group and by only about 42 per cent of the general group.

Reliance on the government for bringing back prosperity—aside from the opinion about prohibition—is noticeably lacking in the automotive industry, analysis of the replies indicates. Reduction of taxes, tariff adjustment, stimulation of public works and amendment of anti-trust laws did get in the automotive "first

The Self Reliance of the Automotive Industry is Proved

ten," to be sure, but they didn't show up strongly as compared to reliance on things that the automotive companies and their executives could directly do for themselves.

Analysis of the entire list of twenty items, comparing automotive with general emphasis, shows up the same tendencies as those exhibited in the foregoing discussion of the first four items. Ten of the twenty items checked, let us say, may be classified in a general way as factors about which the individual executive can do little in any direct manner; the other ten are factors on which he can operate directly.

In the general list checks against the "somebody-else-has-to-do-it" items totaled 8980 out of a total of 16,779 or about 54 per cent.

In the automotive list, checks against these ten items were 134 out of a total of 277 or about 48 per cent.

Small Confidence in Governmental Help

Despite the fact that a majority of emphasis in the general list is placed on these factors which require governmental or group action of some kind, there is no general belief indicated by the reports in any likelihood of action being taken by governmental or group agencies. Many executives, in other words, seem to feel that government action on taxes, public works and whatnot, would help more than anything else to bring back prosperity, but exhibit little confidence in any constructive action being taken

by such agencies. "An undercurrent of resentment toward law-making bodies is one of the outstanding facts revealed by this research," the Sherman Corp. summary of its investigation states. "The resentment means," the report continues, "that many men believe legislative interference with the normal workings of economic law and principles is one of the biggest handicaps to business. There also is a relationship evident between this resentment and a deep-rooted conviction that in the United States are politi-

cal forces which represent an underlying liability in the whole economic situation . . . Extravagance in government—Federal, state, municipal—is scored again and again as a reason for high taxes."

In this opinion that little constructive action is to be expected from governmental action, automotive executives in general seem to agree with their fellows in other industries. The chief difference is indicated, however, in the percentage discussed in previous paragraphs. A major-

(Turn to page 415, please)

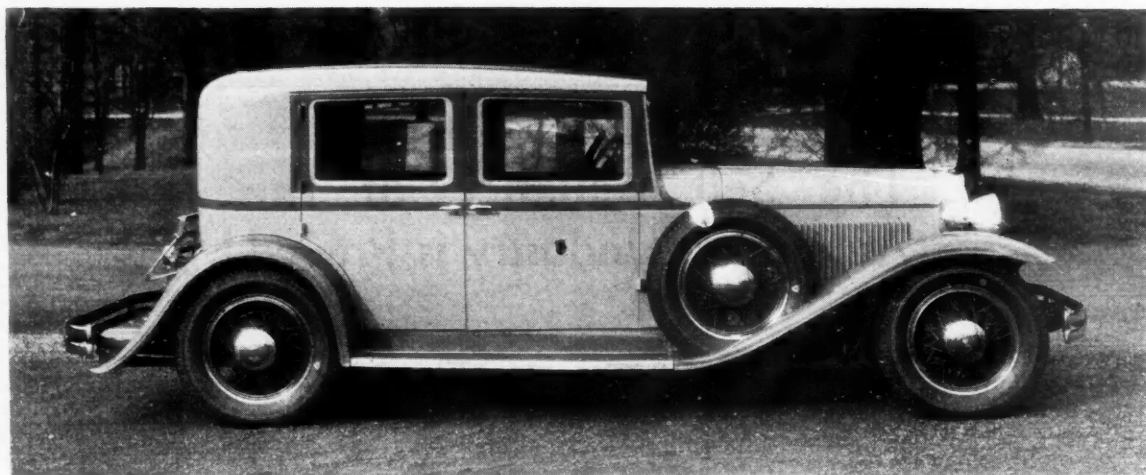
The Complete Summary

2304 Business Leaders

Factor	Times Checked
1. Modification (or Repeal) of Volstead Act	1280
2. Reduction of Taxes	1142
3. Stimulation of Public Works	1117
4. Revision of Sales and Merchandising Plans	1028
5. Reduction of Operating Costs	1027
6. Development of New Products	1025
7. Amendment of Anti-Trust Laws	993
8. Tariff Adjustments	987
9. Lessening of Competition by Trade Assn. Practices	983
10. More Liberal Buying	982
11. Intensified Management	872
12. Improvements in Manufacturing Procedures	857
13. Lower Retail Prices	826
14. Shorter Working Hours	642
15. Easier Commercial Bank Loans	612
16. Lessening of Competition by Mergers	566
17. More Advertising	511
18. Plans to Curtail Raw Commodities	511
19. Lower Wage Rates	425
20. Adjustment of Gold Reserves	373

45 Automotive Executives

Factor	Times Checked
Modification (or Repeal) of Volstead Act	26
Reduced Operating Costs	24
Improved Manufacturing Procedures	21
Development of New Products	21
Reduction of Taxes	19
Shorter Working Hours	18
Tariff Adjustments	17
Stimulation of Public Works	16
Amendment of Anti-Trust Laws	16
Intensified Management	15
Lower Retail Prices	14
More Liberal Buying	12
Lower Wage Rates	12
Revised Sales and Merchandising Plans	11
Lessening of Competition by Trade Assn. Practices	10
Plans to Control Raw Commodities	8
Easier Commercial Bank Loans	8
Lessening of Competition by Merger	5
More Advertising	2
Adjustment of Gold Reserves	2



Straight side view of the Hoffman front drive, with Baker-Raulang body

Hoffman Front Drive Allows for Hood of Normal Proportions

IT ISN'T often that an automobile of novel design, sponsored by an individual not directly connected with a manufacturing company, reaches the stage where experimental models are completed and tested out. That, however, applies to a front-drive automobile designed by R. C. Hoffman, consulting engineer, Detroit. Two of these front-drive cars were built by Mr. Hoffman, and one of their most noteworthy features is that such dimensional elements as the hood length and the length of body space in proportion to wheelbase length are substantially the same as in the conventional rear-drive car.

Designers of front-drive cars in the past usually have found themselves faced with the necessity of allocating greater proportion of the chassis length to the hood than is customary. In a rear-drive car hood length is determined by the sum of the engine length, the space occupied by the radiator fan, and the clearances required. In the case of a front-drive car this is increased by the lengths of the transmission case and of the clutch housing, provided, of course, these are located between the engine and the radiator.

In the Hoffman front drive the additional hood length required has been reduced, generally speaking, to the space necessary for the insertion of a clutch housing. This has been made possible by the use of a transmission included in the same housing with the final drive gears and occupying the same space along the length of the chassis as the latter. While there is a hollow recess in the dash for the engine, this is not sufficiently deep to prevent grinding in of the valves of the rear cylinder while the engine is in the chassis.

The transmission, which is illustrated in section herewith, is of the three-speed type, with helical gears for quiet countershaft drive and second speed pairs, and with the pinion for the hypoid final reduction, mounted on what normally would be the transmission mainshaft. With this layout, Mr. Hoffman states, reduction ratios of from $3\frac{1}{2}$ to 4.8 to 1 can be used.

The transmission mainshaft, it will be noted, is carried at the rear end in a straight roller bearing,

while a double taper roller bearing mounting is used at the front end to take the radial load as well as the thrust from the helical gears. The countershaft drive gear is shown machined on the clutch pilot shaft, and thrust washers are indicated as being used to take the end thrust from the helical gears at both ends of the countershaft.

Engagement for direct drive is through a sliding dog clutch, mating with teeth on the mainshaft just back of the roller bearing. The countershaft is of fairly conventional design, with the gear cluster carried on the dead shaft by means of roller bearings. Second-speed engagement is by means of a sliding dog clutch on the countershaft, the mainshaft gear in this case being locked on its shaft, while the countershaft gear runs idle when not engaged. This gear cluster, it will be noted, is located just in "back" of the hypoid pinion. Immediately "ahead" of this pinion is a spur gear which serves for low-speed and reverse gear engagement, again through sliding members on the countershaft. Endwise adjustment for the mainshaft or pinion shaft is effected by means of shims at the front-end bearing mounting.

The starting crank in this design is shown located below the countershaft in the case, with drive to the countershaft through a roller chain, and from there to the mainshaft through the countershaft drive gears. This arrangement has been used to insure the minimum of overall height for the case, for ample radiator depth. Mr. Hoffman states, however, that the entire layout is purely a tentative one, and that this, as well as other design details, are capable of considerable modification without interfering with the general effect the design is intended to produce.

From the transverse section of the transmission case it will be noted further that the differential is offset to one side, this being necessary to permit the inclusion of both the usual axle and transmission parts in the same case. The flanges at the ends of the axle shafts are for the mounting of universal joints, Mechanics Machine Company joints having been used in building the experimental cars.

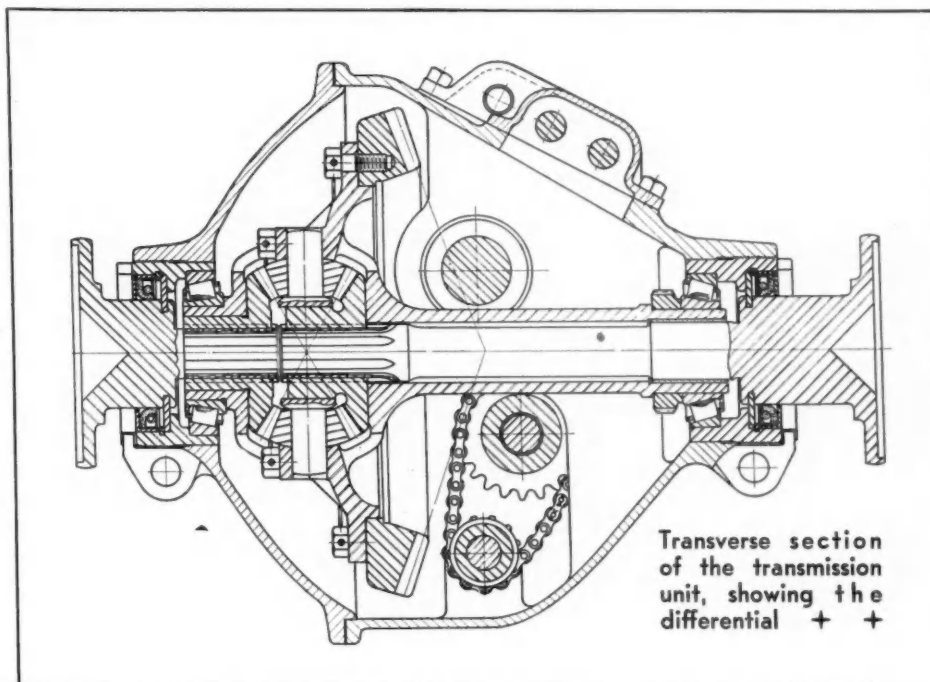
Other details are worth noting in the transmission. The case is split in a vertical plane, lengthwise, for ease of assembly and to insure a good bearing set-up. The drawings do not show the mounting arms for the case, which are located near the front end, and which are bolted to the radiator cross-member. The split in the case is similar in form to that of a differential housing split at the side, the machined surfaces at the split being circular in shape. At the rear end of the case the contact faces of the halves of the transmission case just reach the clutch-housing mounting face.

The case, of course, is cast iron, and its design apparently makes it relatively easy to cast in green sand, with only a few placement cores. The differential carrier is a forging.

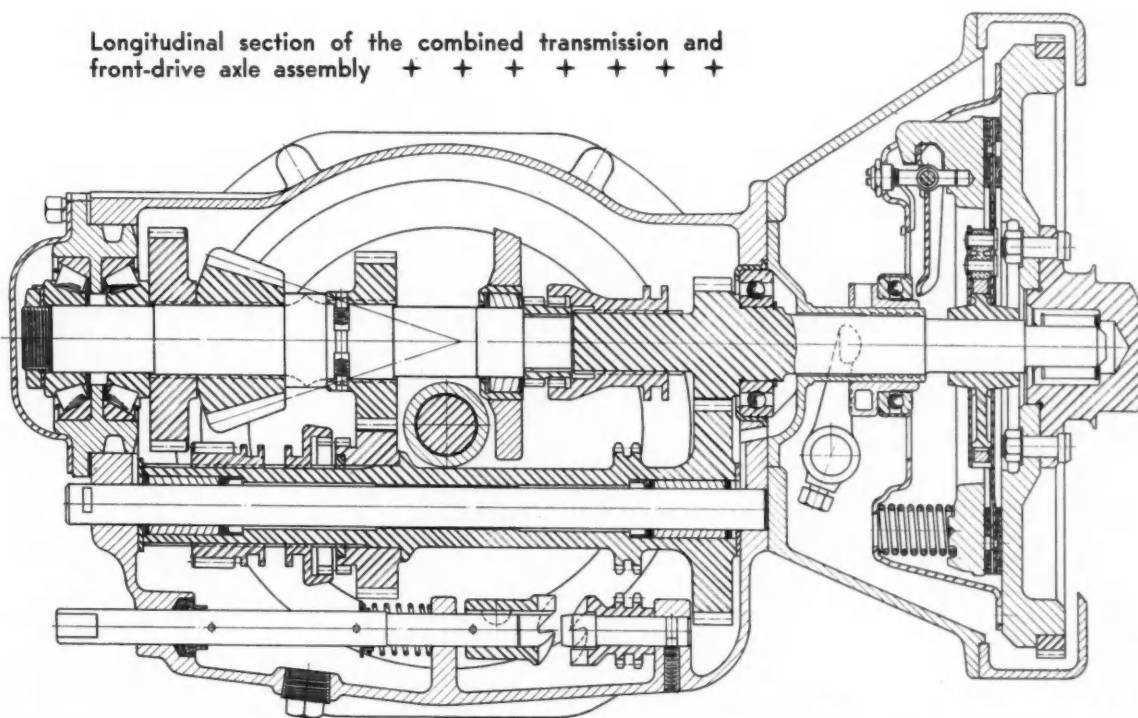
A Lycoming eight-cylinder $2\frac{7}{8}$ in. bore stock engine

has been used in these cars, with the drive taken from the flywheel end by placing the engine with the flywheel end forward in the chassis. The torsional vibration damper is retained, and from the damper pulley a double belt drives an accessories shaft located at the side of the cylinder block, which shaft operates the generator, the water pump, and the fan, the latter, of course, at the forward end of the engine. The clutch is a conventional Long single-plate unit.

Front brakes are located at the wheels in the Hoffman front drive, and a solid load-carrying front axle
(Turn to page 415, please)



Longitudinal section of the combined transmission and front-drive axle assembly + + + + +



Low Idling Speed on Nine Cylinders Possible With Improved Aircraft Diesel

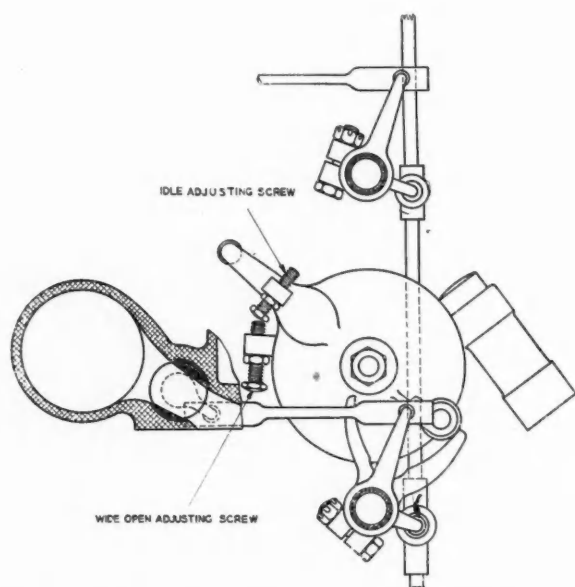


Fig. 1—Drawing showing the air throttle valve and throttle mechanism + + +

TWO major criticisms that have been made against the Packard Diesel in the past relate to smoke and landing characteristics. It will be remembered that this is a single-valve engine, the same valve serving for both the air intake and the exhaust. Speed regulation is obtained by varying the stroke of the fuel injector pumps by means of a hand "throttle." As originally developed the engine was not provided with any means of materially reducing the volume of air taken in at "closed throttle." In a gasoline engine the closing of the throttle, of course, builds up a restriction in the intake, which is reflected in a high manifold vacuum and increased apparent "friction" horsepower.

In an airplane this "power loss" at closed throttle in the intake system has the advantage of virtually acting as a "brake" on the propeller. In the former Packard Diesels this braking effect was absent, since the flapper valve in the air intake venturi served only to trap a portion of the exhaust gases, without materially affecting the volume of air taken into the cylinder. The net result was that in order to insure a sufficiently low idling speed, a three-cylinder idle had to be used. It also meant that the pilot in gliding into a landing had to open his throttle when flattening out to insure against stoppage of the engine.

To overcome this handicap, a barrel-type

Operating only at low speeds, barrel type valve, in the combination intake and exhaust port, builds up a restriction equivalent to that of a closed throttle position on a gasoline engine + + + +

valve of duralumin is now placed in the combination intake and exhaust port, and is connected to the "throttle" in such a manner that it is effective only at low engine speeds. The valve being then closed, it builds up a restriction in the port equivalent to that of the closed throttle position in a gasoline engine. As in a gasoline engine, there is sufficient clearance around the barrel valve so that the passage is at no time completely sealed.

This throttling of the air intake has a number of direct effects. Primarily it puts an additional load on the engine equivalent to that required to draw the intake air through the clearance space around the

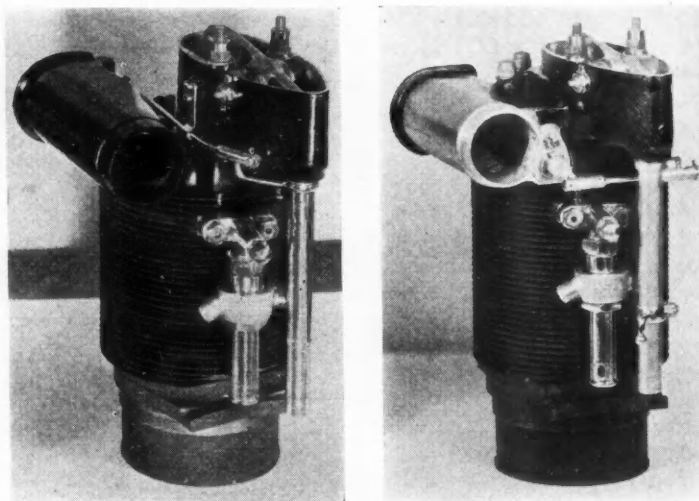


Fig. 2—Old and new cylinder heads

closed valve. Next, it traps some of the exhaust gas in the cylinder and port, due to the restriction present, producing a higher initial temperature before compression, a desirable feature at small "throttle openings" in a Diesel. Of course, both of these effects also cause a reduction in the amount of excess oxygen present in the cylinder at idling, thereby reducing the air-to-fuel ratio and insuring better combustion without increase in fuel consumption.

The braking effect produced by this throttle is estimated as equal to between 12 and 13 hp. at 1200 r.p.m., from results obtained on a single-cylinder engine. This represents a considerable percentage of the power absorbed by the propeller at that speed, and makes it possible to idle all nine cylinders in the new engine. Such throttling, moreover, affords better accelerating characteristics, since the engine is accelerated on all nine cylinders, whereas formerly it had to be accelerated through several hundred r.p.m. on three cylinders, whereupon the other six cylinders would cut in.

The position of the barrel valve, at the rear of the engine, where the other controls are located, also simplifies the control mechanism, as may be noted from Fig. 2, showing the old and new cylinder heads. Several heavy ribs have been added to the cylinder head to increase its rigidity.

Changes have been made also in the piston. Fig. 3 shows the old and new types. As formerly, the combustion chamber is formed in the top of the piston, but in the new design the depth of this chamber (across the piston head) has been increased, while the height of the raised portion has been increased to lower the "low clearance" space over the piston. This is now approximately 1/16 in. The depth from the top to the bottom of the combustion chamber also has been decreased, as may be noted from the machine clearance space for the valve found in the new pistons.

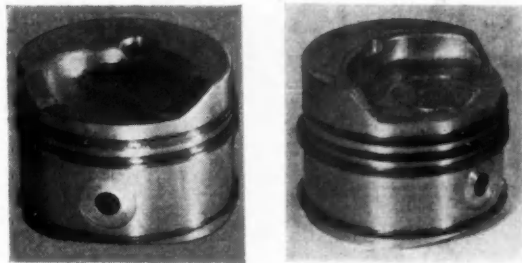


Fig. 3—Old and new pistons

Decreasing the depth of the low clearance space over the piston has the effect of adding vertical turbulence to the turbulence in a horizontal plane in the main chamber, this added turbulence being caused by squeezing out the air from the low clearance space.

With the new design it is also possible to have a somewhat greater penetration of the fuel spray without the oil impinging on the far side of the piston.

The net result of these changes has been a sufficient increase in combustion efficiency to virtually eliminate exhaust smoke. An indication of the improved combustion is found in the coincident reduction of the stroke of the fuel injector pumps. This stroke has been reduced from a maximum of 13/64 to 11/64 in.

Another change in the piston is the addition of a second oil ring, located above the piston pin. The groove for this ring is drilled for oil return on the thrust faces. At the same time the clearance at the bottom of the piston has been increased, so as to permit somewhat more oil to pass the lower oil ring. The purpose, of course, is to improve the lubrication of the main part of the skirt, especially at its largest diameter. (The piston is ground eccentric.)

Compression and Oil Temperature

W. R. RAMSAUR of the Harrison Radiator Co., in a paper on "Oil Cooling and Oil Coolers," presented at the S.A.E. annual meeting, pointed out that developments in engine design have resulted in higher temperatures of lubricating oil, which in turn have made necessary the use of oil coolers. Mr. Ramsaur said that the higher oil temperatures resulted from (1) increased horsepower; (2) increased compression pressure and (3) increased engine r.p.m.

The contention that oil temperatures have increased is undoubtedly correct, but it is very questionable whether the increase in compression ratios has had anything to do with it. If we take two engines that are identical except for the compression ratio, and operate both at the same speed and with the same quantity and quality of mixture, the same amount of heat will be liberated in both, but the one with the higher compression ratio will develop the most power (provided it is not detonating), hence the amount of heat that has to be discharged in unit time via the exhaust and the cooling water and by direct radiation will be less in the high-compression engine. The temperatures at various points of the engine, under conditions of equal mixture consumption, will therefore be lower in the high-compression engine.

The chief reason for the increase in oil temperatures is undoubtedly the increase in operating speeds. High engine speeds call for large bearing diameters, which, together with large rotary speeds, result in high rubbing speeds, and the heat generated in a bearing is directly proportional to the rubbing speed or the velocity of shear in the oil film.

On the other hand, the whole engine will be hotter, because with the same volumetric efficiency and the same thermal efficiency the amount of heat which must be discharged per unit of time by way of the exhaust and the cooling water and by direct radiation is directly proportional to the engine speed. It is obvious that with the more rapid flow of heat the various parts of the engine will assume higher temperatures.

International Harvester is Third in Sales

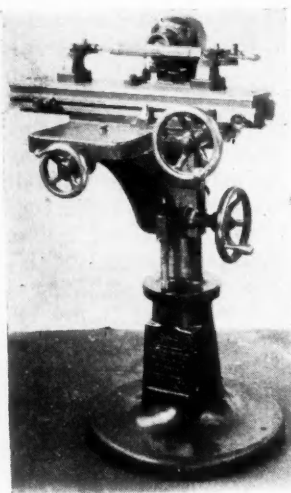
THROUGH an error, new commercial vehicle sales tabulation, page 311 of Statistical Issue, International Harvester Co. was shown in twelfth place. The totals of commercial vehicle sales for 1930 show International Harvester Co. in third place among United States manufacturers with a total of approximately 24,000 units or 5.84 per cent of total truck sales.

NEW DEVELOPMENTS—AUTOMOTIVE

Greenfield No. 4R Reamer Grinder

A LIGHT tool room reamer grinder, No. 4R, has been placed on the market, according to a recent announcement by the Greenfield Tap and Die Corp., Greenfield, Mass.

Wheel spindle drive is by means of an enclosed motor, mounted integrally with the grinding spindle. This revolves in large size ball bearings,



a single row at the back end and a double row at the wheel end arranged to handle both radial and thrust loads. The whole wheel head swivels to any desired angle with the table, and is provided with graduations. A special feature of this machine is that the work table has a vertical movement in addition to a horizontal movement. The table rests its full length upon the longitudinal slide upon which it

swivels. It is provided with a screw adjustment for swiveling for taper work and is graduated upon the right-hand end, each graduation representing a taper of $\frac{1}{8}$ in. per foot.

Motor drive is $\frac{1}{4}$ hp., 3450 r.p.m., single phase 60 cycle, 110 volt AC, standard equipment. Floor space 47 x 39 in. Net weight 475 lb.

Cheek Facing and Pin Turning Machine

WITH the demand for machine tools that will stand greater speed and increased feeds, made possible by the higher grades of cutting steel, the Crankshaft Machine Co., Jackson, Mich., have built a machine for facing the cheeks and turning the pins at one operation.

The machine is powered with a 25 hp. motor for turning the work spindles and other rotating parts, and with an oil gear hydraulic feed for advancing the tools to the work. The crankshafts are held in powerful air-operated chucks connected to 12-in. air cylinders. The steady rests are also air-operated. This machine is a double end drive, power being applied to both work spindles and to both ends of the master crankshafts.

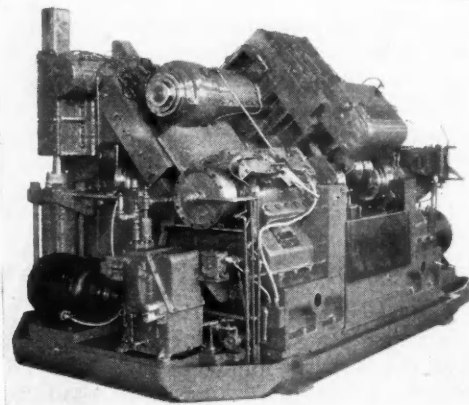
The machine is provided with two sets of tool arms which are carried in a housing mounted between the two upper eccentric shaft housings

and is bolted securely to them making a rigid compact carriage that takes the side thrust of both sets of tool arms and by means of which the upper set of tools are fed into the work. The lower tool arms are driven by the lower eccentric shaft and are carried between the two lower worm gear housings which are mounted on ways in the sides of the columns that support the upper carriage assembly.

The tool on the upper arms rough the cheeks, rough turn the pins and pin walls, while those mounted on the lower arms finish turn the cheeks and pin walls of the crankshaft. The cutting tools are so mounted that changing or adjusting them is a very short operation.

The machine is controlled by two push button stations and three levers. One push button is for the five horsepower motor for the oil gear pump, and as the oil gear pump runs constantly, is only used at the start and close of each work period.

While the machine is automatically operated, it can be operated by hand when desired, it being possible to stop the feed at any part of the cycle and return the carriages to the loading position. It is also possible to stop the spindles at any point in the cycle, but they never should be stopped without also stopping the feed. A jog



or inching button is provided that makes it possible to turn the spindles to any desired position.

Nearly all running parts are provided with flush oil lubrication, pumped to the bearings from a 15 gal. reservoir and the sliding parts and the rest of the running parts are lubricated by the Farval lubricating system.

Weight is approximately 44,000 lb. Floor space: Length for four-cylinder crankshafts, 150 in.; for six-cylinder crankshafts, 156 in.; and for eight-cylinder crankshafts, 162 in. It is 86 in. from front to back, and 89 in. high with work spindles forty-five in. above the floor.

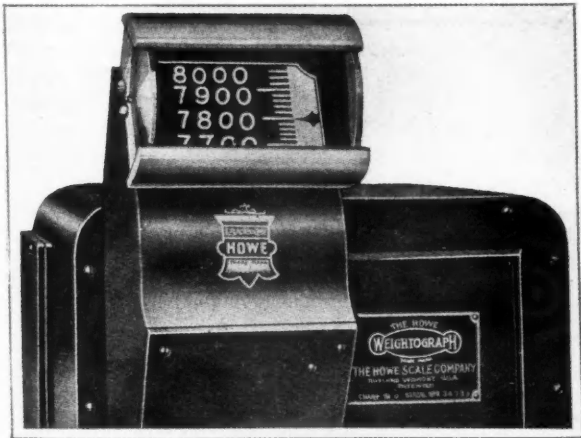
The cycle of operation is rapid traverse five seconds, turning cheeks, one thirty-second to one-sixteenth feed per revolution, turning pins five thousandths to ten thousandths per revolution, return feed seven seconds and reload ten seconds.

The speed and feed will vary with the hardness of the crankshaft to be machined.

PARTS, ACCESSORIES AND PRODUCTION TOOLS

Howe Weightograph

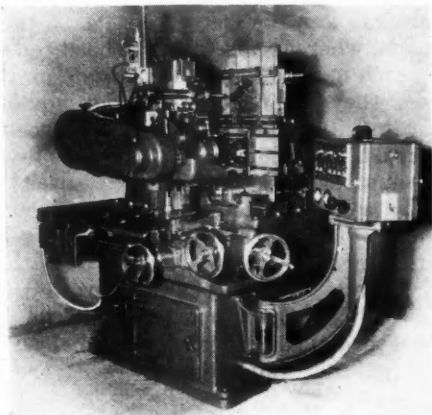
APPLICATIONS of the Howe Weightograph, which is attachable to any built-in type of beam scale from 1000 lb. upward, are described in a new bulletin issued by The Howe Scale Company, Rutland, Vt. Dial scales are also con-



vertible to Weightograph operation by merely removing the dial head; the remainder of scale being retained. When attached to a beam scale (which of course has previously been operated manually by manipulation of the beam poises) the Weightograph provides automatic operation, thus eliminating the human element.

New Small Keller Machines

TO provide an automatic machine for a wide variety of die and tool work up to 12 in. x 10 in., the Keller Mechanical Engineering Corp. announces two small automatic tool room ma-



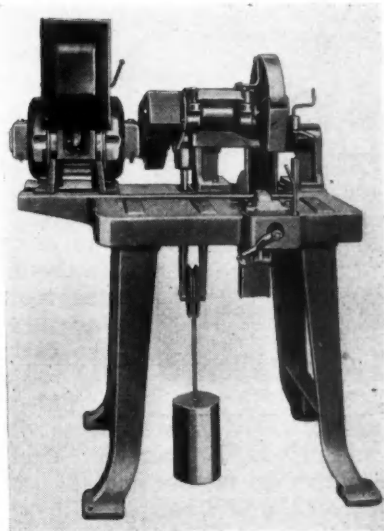
chines—Types G-1210 and GG-1210. These are designed for the rapid, accurate and economical production of such dies as trimming, blanking, piercing, extrusion and progressive; also molds, cams, punches and any odd-shaped work that can

be milled from templates. The Type GG-1210 machine is supplied with a built-in jig boring device so that one may machine, locate, drill and bore to utmost precision in one setting. As in the larger Keller machines, the cutter spindle is guided by simple electrical control from the tracer, following the contour of a template. Aside from occasional manual manipulation of the tracer control ring to give the machine its directional bias, all contour operation is automatic.

A 1½ hp. direct current motor drives the standard cutter spindle by V-belt and four step pulleys, giving four speeds through open belt and four through back gears—engaged or disengaged by means of a single lever. Convenient means are provided for adjusting belt tension.

Campbell Abrasive Cut-Off Machine

THE new Campbell Abrasive Cut-Off Machine which was displayed at this year's Power Show by Andrew C. Campbell, Inc., Waterbury, Conn., is made for cutting steel, steel alloys, iron, non-ferrous metals, fibre, and other materials.



The machine is designed for safety and utility. The handle for operating the disk is arranged so that the operator may use either hand in cutting material. The starting switch is conveniently located on the motor. The positive V-belt drive and the disk are guarded, and there is absolutely no danger of injury to the operator. Other features of the machine are the large table which is so designed that fixtures for special production jobs can be easily attached, the positive V-belt drive, the quick operating vise, and the fact that any steel saw or abrasive wheel can be used with the machine.

The motor is 7½ hp. driving the spindle at 5000 r.p.m. through the stepped up belt drive. Floor space required is 33 x 45 in.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Langelier Screw Blank Machine

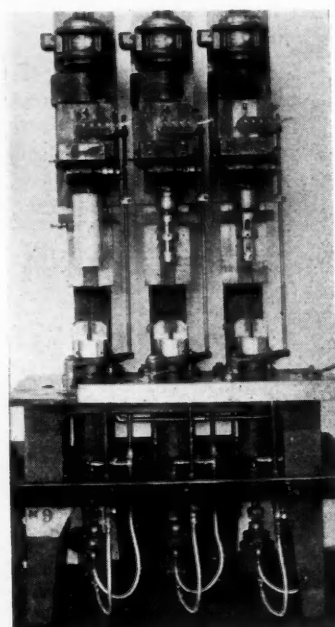
THE Langelier Manufacturing Co., Providence, R. I., has developed a semi-automatic machine for squaring up under the head and rounding the end of cap screw blanks.

The blanks are of nickel steel, the head portion being produced by upsetting, leaving a fillet underneath. The end which is threaded at a later operation comes to the machine in the condition in which the stock is cut off. The machine is arranged to accommodate all sizes of screw blanks from $\frac{1}{4}$ in. diameter by 1 in. long to $\frac{5}{8}$ in. diameter by 6 in. long.

Three Langelier No. 21 automatic units are

mounted vertically on individual columns which in turn are bolted to the table and leg assembly. Each unit is equipped with a special tool having inserted cutters capable of being adjusted for any diameter and length of screw within the range.

Unique lubricating features are incorporated in the design of the tool, insuring coolness of the cutters and the washing out of chips. A cir-



cular guard is attached to each unit to confine the lubricant and protect the operator. Each unit is driven by individual motors and the tool is revolved 700 r.p.m. and arranged with a vertical feed of $\frac{1}{4}$ in. and rapid return.

The work is held in a two-jaw chuck having suitable inserts to grip the head of the screw allowing sufficient projection for the squaring operation. Each chuck is air operated through the medium of a cylinder and draw rod and controlled by a conveniently located valve lever just above the table. This lever also furnishes control for another air cylinder for raising the chuck up into working position which is arranged with a nut and check nut on the piston rod to provide an adjustable stop for height.

The production obtained averages 10 per minute from each spindle or a possible 30 per minute from the machine utilizing the three spindles.

The machine occupies a floor space 48 in. by 60 in. and weighs approximately 3200 lb.

American Hydraulic Bench Actor Press

PRESSURES up to one ton are available with the "V-O" bench type hydraulic press recently introduced by the American Broach & Machine Co., Ann Arbor, Mich. This machine has a 12 in. stroke and ram speed of 50 ft. per



minute. Total oil capacity is four gallons, an interesting feature being that the column serves as the oil reservoir.

The machine is driven by a $\frac{1}{2}$ hp. motor through a roller chain drive. Total height is 41 in. Net weight including motor, 365 lb.

Bulldog Ready-Made Magnetic Blocks

A LINE of standardized, interchangeable, ready-made magnetic blocks has recently been placed on the market by the Congress Tool & Die Works, 430 South Green Street, Chicago. These blocks offer the convenience that they are ready-made, whereas heretofore it has been necessary for each user to make them in his own shop. Moreover, they offer features and advantages which ordinarily cannot be included because of the high cost. Bulldog magnetic blocks are built up of a number of laminations of special alloy "electric" steel, separated by non-magnetic layers or segments of uniform thickness. All sections are riveted together by high-tensile strength, non-magnetic rivets. The blocks measure $3\frac{3}{4} \times 2\frac{1}{2} \times 1\frac{1}{4}$ in. All faces have been ground true within the closest practical limits, all parallel surfaces are truly parallel and adjacent faces are truly 90 deg.

The magnetic circuit has been designed so as to cut down to the minimum the hysteresis or iron loss and leakage flux between laminations. The special silica alloy or "electric" steel results in a strong magnetic circuit but free from residual magnetism.

Hoffman Front Drive

(Continued from page 409)

is used. The weight of this unit is fairly low, however, since torque arms fitting into rectangular holes in the I-beam near the wheels are provided to take the torque load. This also has made possible the use of conventional semi-elliptic springs at the front end. The torque arm arrangement is similar to that used on the Bugatti, Austro Daimler and Alfa Romeo.

Individual wheel suspension is used at the rear of the car, the springs being semi-elliptic. Torque arms run forward to the frame side-rails, where they are carried in bronze bushings. The frame, of course, has no kick-up at the rear end, and is in fact straight throughout, except for the front spring horns. A large X-type cross-member is used near the center of the frame. Integral frame bumper brackets are included, so as to enable the use of the bumper, doweled to the frame side rails, as a means for taking front-end frame torsion. Steering is quite conventional.

The designer states that the minimum road clearance for the cars as built is about 9 in. under the transmission case, using 6-in. tires on 19-in. wheels. The overall height of the car is only 67½ in., notwithstanding the fact that 13-in. front and 14-in. rear cushions are used. Head room is certainly ample, in spite of the fact that the seat angles call for a fairly erect posture. In this connection Mr. Hoffman states that he has made no special efforts to produce a low car, except by taking advantage of the opportunities afforded by the low frame height accompanying the front-drive designs.

It is understood that one of the largest automotive parts corporations has been licensed to build the trans-

mission and drive unit, which latter is probably the main feature of the Hoffman car.

Thermostatic Control of Crankcase Oil

(Continued from page 405)

the engine will die.

4. It has been shown that a motor oil which will give first-class starting results in a given car may be entirely unsuited for a second car under the same winter temperatures.

5. The most adverse starting conditions are encountered immediately after charging the engine with fresh oil. After several days operation sufficient dilution of the crankcase oil occurs to reduce materially the starting effort required.

6. It is suggested that crankcase oils be changed if possible on warm days, so that they may have a chance to reach dilution equilibrium before the next cold day arrives.

7. Every operator should realize that it is important for him to make certain that his starter, battery, ignition system, spark plugs, gap settings and carburetor adjustment are correct. If more attention were paid to these factors much less starting trouble would be encountered when cold weather arrives.

8. After starting a cold engine it should be allowed to idle until lubrication is fully established. Otherwise bearings and cylinder walls may be scored.

9. It is not necessarily true that low pour point oils will establish lubrication more rapidly than high pour point oils. The viscosity of the oil at the crankcase temperature is as important as the pour point.

JUST AMONG OURSELVES

(Continued from page 407)

ity of automotive opinion not only is skeptical of generalized activity, but doesn't think that it is necessary for the most part.

More executives in the general list believe such generalized activity to be needed but unlikely.

Reverting again to the four items receiving major emphasis in the automotive list, it is worth noting that the executives of our industry, singly and as a group, really have been doing pretty well in practicing what they are preaching. Even as regards working for repeal of the Volstead Act—the only non-individual factor near the top of the automotive list—very important automotive executives have offered powerful public

and private support to the forces working for repeal, although some of the leaders in our industry are definitely opposed to repeal.

As regards reduction of operating costs, improved manufacturing procedures and development of new products, however, the industry has been almost a unit in forwarding activity and progress in these directions.

With the tremendous emphasis that the automotive industry has been putting on merchandising and selling activities, though, it is surprising to find "revised sales and merchandising plans" and "more advertising" so very far down in the automotive list.

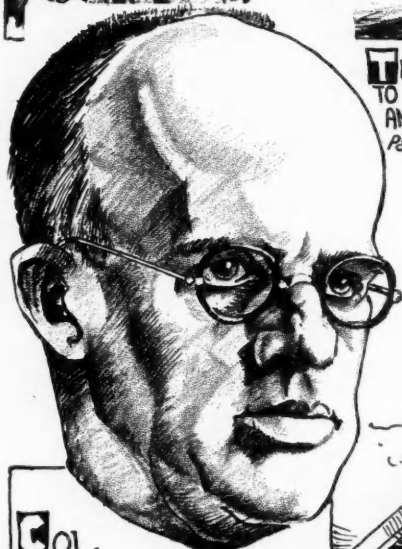
Seeing these two items in

14th and 19th place, respectively, one might draw the conclusion that, despite our vaunted salesmanship and marketing activity; despite our boasted advertising appropriations and despite our talk of being in a merchandising era, we still are a mechanically minded industry, thinking more strongly in terms of production and engineering than in terms of scientific and effective distribution.

But such a conclusion in general would be unfair on the basis of so limited and relative an appraisal as this particular investigation provides and some less dramatic explanation probably is the correct one for the relative position in this list of these merchandising factors.

—N. G. S.

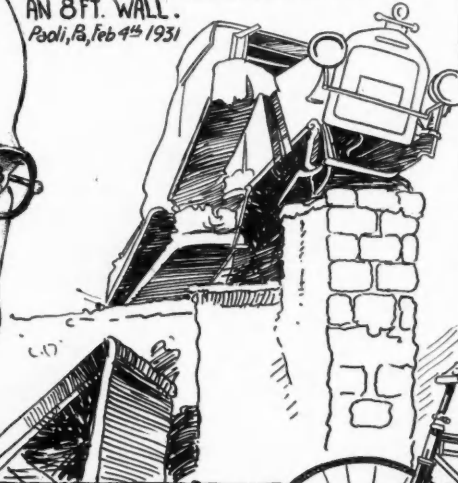
Automotive Oddities—By Pete Keenan



COL. PAUL HENDERSON

When assistant Postmaster General, was called a Potential Murderer by a Prominent Pilot for suggesting the Mail Planes should fly at night.

THIS TRUCK SIDESWIPED A CAR, TOOK TO THE AIR AND MADE A LANDING ON AN 8 FT. WALL.
Pooli, Pa., Feb 4th 1931



MOTORCYCLE DESIGNED AND BUILT BY N.S. HOPKINS, WILLIAMS-VILLE N.Y., IN 1894.



THERE ARE MORE AUTOMOBILES IN U.S.A. THAN TELEPHONES.



NEWS OF THE INDUSTRY

Rates on Automobiles As Freight Reduced

N.A.C.C. and Rail Officials Reach Agreement for Reclassification Basis

NEW YORK, March 4—Freight rates on automobiles shipped by rail have been reduced as a result of a series of conferences between a special committee of the National Automobile Chamber of Commerce and representatives of railway executives.

As a result of these conferences automobiles shipped over distances greater than 500 miles, which are now rated as first-class freight, are charged at 100 per cent of the regular first-class rates instead of 110 per cent of these rates as heretofore. Special commodity rates have been agreed upon for shipments of less than 500 miles from factory or assembly plants.

There has also been a reduction in minimum weight per vehicle which will allow manufacturers to use freight cars to greater advantage than heretofore. The minimum weight for a 40-foot car has been reduced from 11,400 lb. to 10,000 lb., and that for a 50-foot car has been reduced from 16,200 lb. to 13,500 lb.

Railroads have also agreed to make freight cars more readily available for floor loading so that there will be less expense and time lost in handling of cars by railway freight.

E. N. Hodges of Hupp is chairman of this special committee which negotiated these reduced rates, and other members are J. H. Hyler, Chrysler; F. A. Allen, Hudson; E. D. Drinnell, Buick; C. R. Scharff, Chevrolet, and G. M. Sherman, Studebaker. J. R. Marvin, assistant general manager of the N.A.C.C., represented the Chamber staff in these negotiations.

Studebaker Names Smith

SOUTH BEND, IND., March 5—W. W. Smith has been appointed executive engineer in charge of experimental production for the Studebaker Corp.

For the past 5 years Mr. Smith has been service engineer for Studebaker and his promotion to the new post follows the resignation of G. M. Hartsock. A. E. Hunt has been promoted to service engineer to fill the vacancy left by Mr. Smith.

The News Trailer

By Herbert Hosking

Exhibit A in a Long Island murder trial was an automobile . . . so they tore down Exhibit A and reassembled it in the courtroom . . . with the rising tendency of automobiles to become Exhibits A, courtrooms need wider doors. They would also permit entrance of a fat and lazy Justice * * * M. J. Meehan & Co., 61 Broadway, N. Y. C., will send you an analytical report on Ford Motor Co., Ltd., free gratis for nothing * * * Traffic in the Holland Tunnel took a big leap in 1930 and now N. J. and N. Y. want a Weehawken Tunnel . . . many a man has lived and died waiting for the Weehawken Ferry * * * the Cleveland Auto Club last year aided 20,000 stranded motorists, replaced or repainted 2900 road markers and conducted 3653 investigations for members . . . boy, a statistician * * * an Auburn stock car won the 250-mile Copenhagen road race and His Majesty Prince Erik of Denmark showed his appreciation by ordering one of the cars * * * Maryland is looking for a way to specially tag novice drivers so that other motorists may give them a wide berth on the road . . . a double service could be performed by requiring the novice to remove all the fenders from his car . . . he wouldn't have them long anyway and it would be an effective signal * * * the Automobile Club of Illinois has gone on record as condemning the practice of Federal, state and municipal governments of selling at public auction cars seized and unclaimed . . . pointing out that most of them are junk and when sold back into servitude constitute a menace to life and limb * * * in the same connection the current bulletin of the National Association of Finance Companies asks whether sale of such cars is not reaching the proportions of a racket for the benefit of the police, pointing out that some more-or-less-law-abiding motorists have had to get a writ of replevin to get cars back once the police get them * * * we have received a copy of the Irish Motor Trader . . . the editor's message begins: "A chairde" and ends "Bhurgara" . . . no kidding * * * but there's a lot of live matter and a number of jokes which we haven't heard for several years.

Final Hearings Begin On Trucks and Rails

I.C.C. Examiner Starts Ten-Day Collection of Testimony in Washington

WASHINGTON, March 5—Final hearings in the Interstate Commerce Commission's investigation of the coordination of motor transportation with rail carriers were begun here yesterday. Outstanding features at the opening of the hearing were testimony by John F. Deasy, vice-president of the Pennsylvania Railroad, and G. C. Woodruff, officer of the U. S. Freight Co., and a statistical exhibit entered by the I. C. C. showing the extent of investment in motor transportation by Class II and Class III steam railroads, electric railroads and water carriers.

The investigation, which has been conducted by Commissioner Ezra Brainerd, Jr., and Leo J. Flynn, examiner for the I. C. C., was instituted by the Commission on its own motion for the purpose of determining the "legality and propriety" of operation by railroads of motor trucks and buses on the public highways. Hearings in this connection have been held in various sections of the country for several months, at which time transportation authorities have been given opportunities to present their views of the situation.

The final hearings are expected to last about 10 days. At today's session the National Automobile Chamber of Commerce was to present exhibits.

N.A.C.C. Meeting Postponed

NEW YORK, March 4—The regular quarterly meeting of the members of the National Automobile Chamber of Commerce, due today, has been postponed until Wednesday, March 11, because of the inability of some of the members to be present at this time. The directors will meet the following day, Thursday, March 12.

Mooney Due From Europe

NEW YORK, March 5—James D. Mooney, vice-president, General Motors Corp. in charge of Export Division, will return from Europe, where he has been spending the past few weeks in studying the overseas markets, arriving in New York Monday, March 9.

Fourth Quarter Sales Conditions in Twelve Additional

WASHINGTON, March 5—The second of a series of articles on the automotive situation in foreign countries during the fourth quarter and the year 1930 will be published in the March 9 issue of *Commerce Reports*. The surveys given below were typical in form of the many received from the foreign offices of the Commerce and State Departments and compiled by the Automotive Division, Bureau of Foreign and Domestic Commerce. American firms listed on the Exporters' Index may secure more complete information on the following markets, and others in which they may be interested, by communicating with the Automotive Division.

Austria

The Austrian automotive industry made strenuous efforts to secure the home market itself. Foreign competition, however, has been strong and is now making itself felt in the truck market which was not the case previously, at least for medium and heavy duty units. This development has been due to the increased production costs in Austria in recent years.

There has been a discussion of the use by Austrian manufacturers of foreign parts, such as engines, in order to turn out a home product at lower prices.

Imports of motor vehicles during October and November were 338 passenger cars and 28 trucks as compared with 294 passenger cars and 71 trucks during the same months of 1929. Although statistics for the year were not available, it was believed that imports of passenger cars from Czechoslovakia, the United Kingdom and the United States were stable in 1930, whereas imports from Italy increased 30 per cent, imports from Germany decreased slightly and imports from France dropped 50 per cent. Total imports of trucks for the year were approximately 10 per cent less than in 1929.

The declining activity of the new car market has been favorable to the sale of replacement parts. Many owners have foregone the purchase of a new car and have reconditioned their old motor vehicles.

Brazil

New registrations during the fourth quarter indicated that sales in that period were the slowest in many years. In December there was a return to somewhat normal conditions and efforts were resumed toward the taking of orders for importation.

The present low price of coffee has greatly diminished the use of trucks on the interior coffee estates. Animal-drawn vehicles have come into greater use than for some years past. In many interior districts, where alcohol was available from the local sugar mills, this liquid was used as a fuel with a view to curtailing operation costs of motor vehicles.

British Malaya

The passenger car market was featured during the fourth quarter by a sharp increase in the registration of British cars. Many of these were cars which had been brought from England by their owners

who had placed orders in Malaya earlier in the year and who took delivery in England when on leave.

Values of used cars dropped considerably during the quarter and were expected to drop further. Sales of these vehicles have been made more difficult by the decision of the Singapore municipality to bar from taxi service any second-hand car more than 6 months old.

Although sales of parts and accessories held steady during the second half of the year, the level of business was far below that of 1929. Orders to manufacturers were small but regular.

Colombia

Sales and imports of automotive vehicles in the closing quarter of 1930 increased over the preceding three months. The introduction of new models, lower prices, new highways, increased sales efforts and restocking were favorable factors.

At present there are about 14,000 motor vehicles in the country, most of which are of American origin. It is believed that there is an important potential market for motor vehicles, particularly trucks. With the building of new highways, which has gone on despite the depression, there was an immediate demand for trucks of from ½-3 tons. The steady decline in cost of gasoline and oils also favors the increased use of motor vehicles.

Many cities now have bus lines. Bogota, Medellin and Pereira have street car lines and competing bus services. Any improvement in business conditions will undoubtedly result in extension of new and additional bus routes.

The motorcycle trade declined sharply in 1930. At present these vehicles are used only for pleasure. The police authorities are not using many for patrol purposes, although the growth of automobile traffic may result in an expansion of motorcycle sales.

Finland

The automotive market was dull during the closing months of 1930. Sales were principally in the low-price class. The used car market was also inactive. Stocks of new cars were not considered high, as imports have been considerably less than during the same period of 1929 and all preceding quarters.

Some of the retarding factors in the truck business were the general economic depression, the lack of capital for financ-

ing new purchases and the signs of a real winter with plenty of snow, making the use of trucks for the hauling of logs less necessary.

Total registrations as of December 1, 1930, were 22,888 passenger cars, 10,724 trucks, 1169 buses, and 5234 motorcycles. The increased registrations of new passenger cars and trucks during the year were 2100 and 2485 respectively.

Germany

Fourth quarter automobile sales were small, due to the influence of the coming winter and the continued business stagnation. As far as American cars were concerned, those hardest hit were the medium-priced vehicles. Sales of the more expensive American passenger cars were made, but at a reduced rate.

One exception to the generally poor business was the experience of an American assembly plant which turns out low-priced vehicles, and whose sales of passenger cars and taxis increased. Another large American assembly plant definitely closed and the agency was given over to a German importer.

Dealers and manufacturers were carrying a large stock of motorcycles which have to be worked off. Imported machines were selling very slowly because of their rather high price.

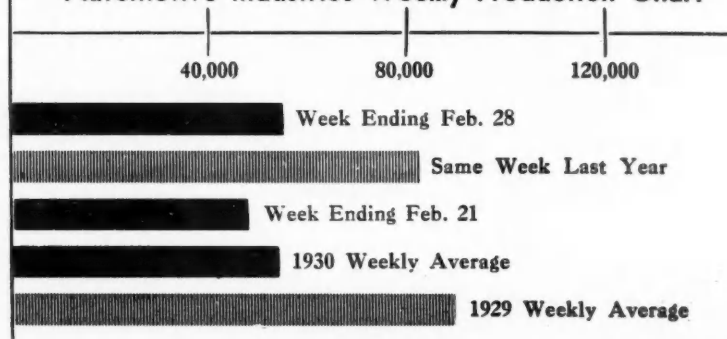
The general tendency has been for accessories to be supplied by local manufacturers. However, the sale of American parts both for domestic automobile production and replacement tends to increase. There is hardly a single German car which does not have some American part built into it, including such items as crankshafts, bearings, oiling systems, gears, and other important parts of the chassis.

Hungary

Dealers continued their policy of retrenchment during the quarter and there were no further bankruptcies recorded. The stocking of all cars other than the lowest-priced was avoided, and display demonstrators were kept at a minimum. Imports showed a close relation to sales and as a result the motor vehicles on hand were gradually being disposed of.

The truck market displayed greater strength than that of passenger cars. Low-capacity trucks of 1½ tons and under accounted for 2/3 of the total sales (about 125) during the quarter. Most of the American trucks sold were in the

Automotive Industries Weekly Production Chart



Foreign Markets Reflect Policy of the Domestic Field

light-weight category. The normal scattered demand for high-capacity trucks was supplied by local factories.

One of the most encouraging features of the fourth quarter was the steady though small business in replacement parts, accessories and service appliances. This was all the more remarkable considering the high prices charged by local wholesalers and retailers of such material. These prices are reported sometimes to be 200-300 per cent higher than at the factory.

Netherlands

Sales of American motor vehicles during 1930 amounted to about 17,700 or 86 per cent of the total. French manufacturers sold about 1300 units, German 700, Belgian 300 and British 200. Imports for the year were 13,540 passenger cars and 7210 trucks as compared with 14,123 and 7860 in 1929.

New car stocks at the year end were moderately heavy and were increased at the beginning of 1931 by new models for the show and sales floors. Prices were sharply reduced on old models to clean them out.

Motorcycle sales decreased and competition was very keen. There are only a few American makes on the market. European motorcycles get the bulk of the business due to their light weight and low prices. Government departments, especially police, use the heavier and more powerful machines, generally American.

Netherland East Indies

The increase in imports during the third quarter not only covered all requirements for the balance of the year, but had the effect of over-stocking most importers. Many dealers made drastic efforts to reduce stocks and price reductions were apparent.

Trucks for transportation of commodities suffered in sales, but not as badly as passenger cars. But sales continued to show the best condition of all groups with a slight increase over the previous quarter. Indications pointed to increased expansion of bus transportation.

The large Chinese firms dealing in accessories had a fair year, and due to their willingness to work on smaller profits, seem to be gaining control over their industry. Manufacturers' agents, most of them European, have not met with equal success and considered the year to be a poor one.

Persia

The Persian automotive trade has been seriously retarded by the inability of importers to secure exchange with which to meet their drafts. Imports of motor vehicles decreased 80-90 per cent and there appeared to be no immediate relief in sight. Some dealers reported their ability to dispose of any number of cars they might be allowed to import. However, attempts to dispose of motor products as long as the exchange restrictions remain in force are likely to involve great difficulties.

Many trucks were repossessed by importers after the buyers had defaulted in their payments, and in some cases only

10 per cent of the purchase price was collected. This was a blow to those roving cargo carriers affected, since the practice is to buy trucks on easy terms and make payments from earnings. It was not unusual to find some of these vehicles stripped of essential parts, which were sold because of the absence of new pieces coming into the country.

Rumania

Although sales at the end of the year were seasonally quiet, there was a fair amount of business in the high and medium priced cars, while sales of low priced units were disappointing. Sales of parts and accessories were confined to actual necessities, while those of service appliances were favorable.

Competition between dealers in American cars of all types was keen, but the known reduced purchasing power of the public and the large number of repossessions resulted in a much stricter supervision of credits. Fiat dealers continued to employ aggressive sales tactics with the result that sales for the year will total about 300 units.

Used car prices were seasonally low. However, lack of demand for taxi purposes affected the market for low-priced cars as have the reduced prices at which new cars can be bought.

Sales of American motorcycles were negligible as was competition between American makes. European motorcycles dominate the market because of their

lower price and liberal terms which manufacturers are willing to grant, even going so far as to ship on consignment.

Yugoslavia

The 1930 automotive market in Yugoslavia was relatively good and progressive for American manufacturers. There were about 350 more passenger cars and trucks sold than in 1929, thus establishing a record. Nearly 75 per cent of sales were of American type vehicles. At the close of the year, following the lead of foreign manufacturers, several American producers planned for wholesale and retail financing.

A large number of new bus lines developed during 1930, and although many of the operating companies have not made profits, it is believed that as bus transportation lines become more organized, such enterprises will show good returns.

Hall Lamp Sales Increase

DETROIT, March 2—C. M. Hall Lamp Co., working five days a week on increasing schedules, reports that February sales will show a 50 per cent increase over January, which, while 54 per cent under the volume for January, 1930, was an increase of 33 per cent over December. March releases indicate a further increase of 35 per cent.

Financial Notes

General Motors Acceptance Corp. and subsidiaries report net profit for 1930 of \$14,570,326 after all charges, or \$29.14 a share on this stock. This compares with \$12,456,635, or \$24.91 a share for 1929.

Graham-Paige Motors Corp. showed net loss for 1930 of \$4,969,320, as compared with loss for 1929 of \$1,463,587.

Mack Trucks, Inc., and subsidiaries report net profit for 1930 of \$2,007,606, or \$2.60 a share on outstanding stock. This compares with earnings of \$6,841,068, or \$9.05 a share for 1929.

Bendix Aviation Corp. reports net profit for 1930 of \$1,183,859 after all charges. This is equivalent to 56 cents a share and compares with earnings of \$7,416,408, or \$3.53 a share, for 1929.

Johns-Manville Corp. and subsidiaries report net profit for 1930 of \$3,268,123 equivalent after preferred dividends to \$3.66 a share on common stock. This compares with earnings of \$6,591,916, or \$8.09 a share, for 1929.

American Car & Foundry Co. has declared a reduced dividend of 75 cents on common and regular quarterly dividend of \$1.75 on preferred, both payable April 1 to holders of record March 17.

Doehler Die Casting Co. has declared regular quarterly dividend of 87½ cents on common and \$1.75 on \$7 preferred, both payable April 1 to holders of record March 20.

Electric Auto-Lite Co. has declared regular quarterly dividends of \$1.50 on common and \$1.75 on 7 per cent preferred, both payable April 1 to holders of record March 14.

Motor Finance Corp. has declared regular quarterly dividend of 25 cents, payable Feb. 28 to holders of record Feb. 21.

Trico Products Corp. has declared regular quarterly of 62½ cents, payable April 1 to holders of record March 11.

Electric Storage Battery Co. reports net profit for 1930 of \$5,647,300 after all charges. This is equivalent to \$6.22 a share on combined common and preferred stocks and compares with earnings of \$7,910,904, or \$8.77, in 1929.

Checker Cab Mfg. Co. reports net profit for 1930 of \$504,690 after all charges. This is equal to \$1.16 a share and compares with earnings of \$4,280,416, or \$11.41 a share in 1929.

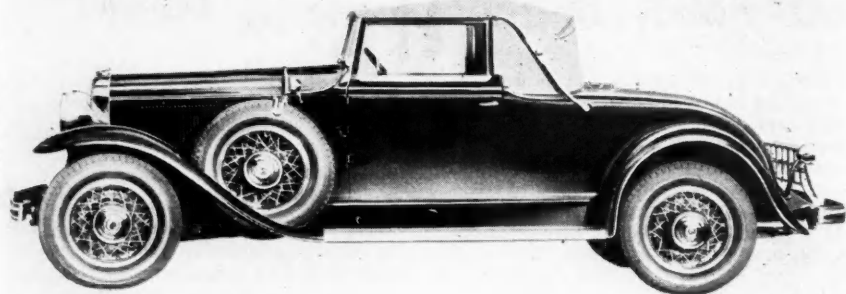
Marlin-Rockwell Corp. and subsidiaries report net profit for 1930 of \$922,171 after all charges. This is equivalent to \$2.53 a share and compares with earnings of \$2,707,405, or \$7.43 a share, for 1929.

United Carbon Co. has omitted the quarterly dividend on common stock due at this time.

Bendix Aviation Corp. has declared regular quarterly dividend of 25 cents payable April 1 to holders of record March 10.

Ross Gear & Tool Co. has declared regular quarterly dividend of 50 cents payable April 1 to holders of record March 20.

Sparks-Withington Co. has declared regular quarterly dividend of 25 cents on common payable March 31 to holders of record March 14, and \$1.50 on preferred payable March 16 to holders of record March 9.



The new Buick convertible coupe sells for \$1,095 on the 114-in. chassis. It is also available on the 132-in. chassis

Brown Joyce

BRISTOL, CONN., March 2—Brown Joyce, a director, vice-president and general sales manager of the Wallace Barnes Co., died here Feb. 26, of septicemia, after an illness lasting two months.

Mr. Brown was born in Jersey City, Dec. 12, 1890, and received his education in the Brooklyn public schools. His business career began with the American Steel & Wire Co. in 1905. During the world war, barred from military service by faulty eyesight, he became purchasing agent for the Turner Construction Co. and had an active part in many wartime building projects for the Federal government.

His connection with the Wallace Barnes Co. began in 1918. Following a period as Detroit sales manager for the company, he moved to Bristol as the general sales manager.

Mr. Brown was widely known in the automotive and other industries. Both within and outside the Barnes organization he engaged in many activities which made him a legion of friends.

Steel Founders to Meet

NEW YORK, March 2—A meeting of the Steel Founders' Society of America, Inc., will be held at the Neil House, Columbus, Ohio, March 19 and 20. During the program John J. Baum will address the Small Castings Division on "New Uses for Cast Steel," and Professor W. Trinks, professor of mechanical engineering, Carnegie Institute of Technology, will present a paper on "The Selection of Materials in Machine Design."

Bendix Denies Connection

NEW YORK, March 3—Vincent Bendix, president, Bendix Aviation Corp., stated emphatically here today that he has no executive connection with the Commercial Instrument Co. nor its subsidiary, the Connecticut Telephone & Electric Co., which last week filed notice of infringement of several ignition patents on practically every important motor vehicle manufacturer.

Although chairman of the board of

Commercial Instrument Co. for a short time last year, Mr. Bendix relinquished that post many months ago.

N. S. P. A. Officials on Tour

DETROIT, March 2—To assist jobbers in organizing local sections of the recently created Maintenance Division of the National Standard Parts Association, E. P. Chalfant, executive vice-president; T. O. Duggan, merchandising service director, and E. J. Leen, finance service director of the N. S. P. A., have spent the past six weeks on an intensive schedule visiting members from coast to coast.

Aero Supply Elects

CORRY, PA., March 3—At a meeting of directors of the Aero Supply Mfg. Co., Frank N. Ames, recently chairman of the board of the company, was elected president, to succeed George I. Stich, who has resigned. Other officers elected were: L. T. McElroy, vice-president in charge of production; Samuel J. Irvine, vice-president in charge of sales and development, and Luke E. Graham, vice-president and treasurer.

Chrysler Has Huge Driveaway

CHICAGO, March 3—More than 300 Chrysler dealers of the Chicago territory left on a special train on the Michigan Central railroad today for Detroit under the supervision of H. A. Rupprecht, divisional manager, to engage in one of the most impressive automobile driveaways ever undertaken. It is to be known as the "Chrysler Prosperity Driveaway."

Chevrolet Dealers Meet

MEMPHIS, March 2—Chevrolet dealers and salesmen had a meeting here today, attended by about 600, at the Ellis Auditorium. H. J. Klingler, vice-president and sales manager; A. W. L. Gilpin, regional manager, and C. G. Smith, local zone manager, had charge. Instruction on sales, sales campaign and installation of zone officers of the 100-Car Club were features.

G.M. Buys Interest In Western Express

Aviation Subsidiary Will Hold New Stock Bought

NEW YORK, March 5—Purchase of 50,000 shares of stock in Western Air Express Corp. by the General Aviation Corp., a General Motors subsidiary, was confirmed in New York today, following an announcement from Los Angeles. Application to list the new shares on the Los Angeles Stock Exchange has been made.

The stock constitutes about 24 per cent of the total outstanding stock of Western Air Express, and marks the first important entry of General Motors interests into the aviation operating field.

Although the purchase price of the stock was not revealed, it has been estimated as between \$750,000 and \$1,000,000. Western Air Express has been one of the principal users of Fokker airplanes, manufactured by a subsidiary of the General Aviation Corp.

Manufacturing interests of the latter now include, besides the Fokker Aircraft Corp., the Allison Engineering Co., the American rights to Dornier flying boats, the Standard Metalplane Co., the Winton Engine Co., and an interest in the Bendix Aviation Corp.

Hudson Places in S. A. Race

DETROIT, March 2—A Hudson car finished second in the 894-mile National Automobile Race at Buenos Aires, according to cable advices received by Hudson officials. The first car to finish over the hazardous course, which was over dirt and heavy muddy roads, was a Mercedes Benz.

Backstay Earnings Drop

CHICAGO, Feb. 28—Net earnings of the Backstay Welt Co. for the year ended Dec. 31, 1930, amounted to \$109,956, after all charges including Federal taxes, as compared with \$293,139 in the preceding 12 months. The 1930 net is equal to \$1.38 a share on 79,085 shares of common stock.

Champaign, Ill., Plans Show

CHAMPAIGN, ILL., March 3—Fifteen dealers of Champaign and Urbana have decided to stage the annual automobile show in the west hall of the University of Illinois on March 19, 20 and 21. Twenty-two makes of cars will be displayed. George Anderson has been appointed manager.

British Experimenting With Heavy Oil Engines

WASHINGTON, March 2—Experiments with heavy oil aircraft engines are being carried out under the direction of the British Air Ministry, according to advices received in the Commerce Department from Trade Commissioner William L. Kilcoin.

Yellow Truck Net Is Near 1929

Sales Dropped 14 Per Cent in 1930

CHICAGO, March 2—Improvements in the line of trucks, buses and taxicabs produced were an important factor in enabling the Yellow Truck & Coach Mfg. Co., to report earnings for the year 1930, only 5 per cent under 1929 totals, while sales registered a decline of 14 per cent.

Last year's sales volume has been exceeded only twice in the company's history, in 1929 and 1928, but despite the large total of sales, earnings of the company have been unsatisfactory for the last five years. The 1930 net profit after all charges and taxes was sufficient to provide preferred dividends 1.06 times over, comparing with 1.84 times in 1929 and deficits before dividends in 1928 and 1927.

Net sales of Yellow Truck and Coach amounted to \$42,725,226 in the year ended December 31, 1930, compared with \$49,908,177 for 1929. Net profit available for dividends was \$1,115,415 last year, equal after preferred dividends to 3 cents a share on the 2,100,000 shares of common stock.

For the preceding year the net income was \$1,177,799 or 6 cents a common share after preferred dividends, before surplus adjustments for prior years totaling \$750,167 or an additional 36 cents a common share.

Crockett Addresses S.I.E.

PHILADELPHIA, March 5—At a meeting of the Society of Industrial Engineers, Philadelphia Chapter, to be held tonight, C. B. Crockett, secretary of the Industrial Truck Association was to discuss "Materials Handling." At the March 19 meeting, Rexford B. Hersey, assistant professor of industry, Wharton School, University of Pennsylvania, is scheduled to speak on "Individual Variations in Temperament and Productive Capacity as Related to Time-Study Allowances."

Ford Adds New Body

DETROIT, March 2—A second body model with sloping windshield is now being shipped to Ford dealers. It is a new town sedan listing at \$625.

The front end is finished similar to the Victoria with composite radiator shell partly lacquered and no exterior sun visor. The body is about two inches longer than the former model and also appears to be slightly wider.

Equipment includes interior sun visor, elastic robe cord, swinging windshield, toggle loops, pocket with flap in back of cross seat and rear arm rests. Additional leg room for the rear compartment is obtained by sinking the floor pan between the sills. All window glass is curved at the top. Adjustment of the cross seat is of the sliding type with the seat mounted on ways. The adjustment incorporates a return spring to make forward movement of the seat easier.

Milan Salon Planned

PHILADELPHIA, March 2—An automobile salon will be held in Milan, Italy, April 16-26, under the auspices of the Associazione Nazionale Fascista fra Industriali dell'Automobile, according to word received by *Automotive Industries* from A. Giaccardi, secretary of the National Fascist Association. Besides automobiles and trucks, motor boats, automotive accessories, and shop and garage equipment will be given display space.

Borg-Warner Declares

CHICAGO, March 2—Directors of the Borg-Warner Corp. yesterday voted a dividend of 25 cents a share on the common stock and the regular quarterly payment of \$1.75 a share on the preferred issue. A similar dividend was paid on the common stock three months ago, prior to which dividends of 75 cents a share were paid for two quarterly periods, these disbursements succeeding a regular \$4 annual rate. The annual report will be released in about ten days.

Hudson Sales Increase

DETROIT, March 4—Hudson reports that its retail sales during the last week in February were 15 per cent ahead of the previous week and were the greatest since the middle of last August. Schedules for the first two weeks in March, based on current dealers' orders, show a 36 per cent increase over the corresponding period in February. Estimated total March sales may show a 60 per cent increase over February.

McCord Reports Profit

DETROIT, March 2—McCord Radiator & Mfg. Co. and subsidiaries reports net income of \$10,807 for year ended Dec. 31, 1930, after all charges, against net income of \$618,490 for 1929. Current assets were \$1,807,542 against current liabilities of \$167,506, ratio of 10.8 to 1.

Falls Tires Will Be Made in England

Plant Will Also Supply the Continent

AKRON, OHIO, March 2—Announcement was made at the annual meeting of the Master Tire & Rubber Corp., held here today, of the completion of plans for English production of the Falls Roadmaster tire. With English factories soon in production, a decided increase in Falls sales is forecast for this year.

January 1, 1931, marked the beginning of the first full year's business of the Master Tire & Rubber Corp., which was organized April, 1930, to acquire the Falls Rubber plant at Cuyahoga Falls, and the Cooper and Giant factories at Findley. The three factories have shown a 50 per cent increase in February sales over January, according to the report of the president.

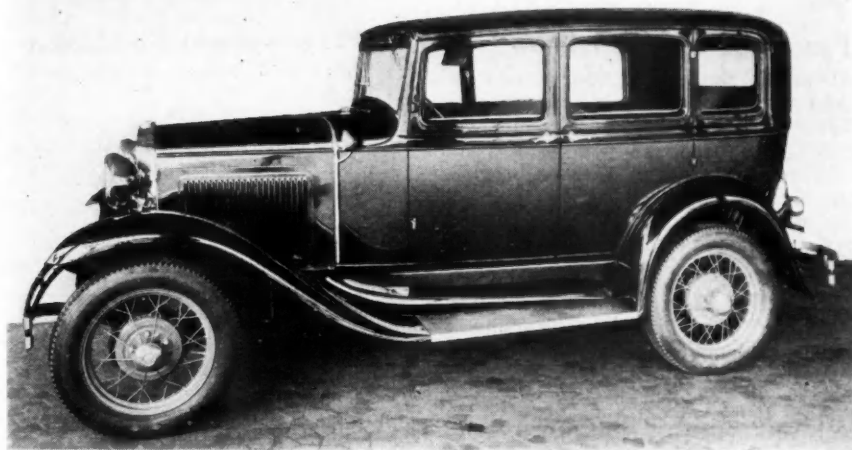
Officers elected at the Master meeting were I. J. Cooper of Cincinnati, chairman of the board; R. P. Bremer of Youngstown, president; F. C. Milhoff, Akron, vice-president; W. P. Cline, Akron, vice-president and treasurer; J. F. Schafer of Findley, secretary, and W. G. Lerch, Akron, production manager. These officers were named to the board together with C. E. Hart, R. L. Krider and J. B. Firestone.

Monmouth, Ill., Plans Show

MONMOUTH, ILL., March 2—The State Armory building has been secured for the annual automobile show by the dealers' association here, and the dates fixed for March 11 to 14 inclusive. No admission will be charged.

Federal Truck Declares

DETROIT, March 4—Federal Motors Truck Corp. has declared a 10 per cent dividend payable April 1, to stock of record March 30.



The new Ford town sedan with sloping windshield is shown above. The photograph was taken on the salesroom floor of the Stark Hickey Co., Ford dealers, Detroit, and made available through the courtesy of the dealer.

Men of the Industry and What They Are Doing

Auburn Names Tainsh

Appointment of John Tainsh to the position of sales manager of the Auburn Automobile Co. was announced today by N. E. McDarby, vice-president in charge of sales. Mr. Tainsh will assume his duties immediately.

Mr. Tainsh comes to Auburn from the Marmon Motor Car Co. after six years with that company as sales manager and assistant director of sales.

Dodge Advances Ridenour

The appointment of K. A. Ridenour to the newly created post of director of sales promotion, announced by A. Van der Zee, general sales manager, Dodge Bros., today, presages the inauguration of an expanded program of sales and service promotion by this company among its dealers. Allison Miller, formerly connected with the advertising department has been advanced to succeed Mr. Ridenour as assistant sales manager of the truck division. Mr. Ridenour will assume his new duties Monday, March 9, on his return from an extended tour of the United States investigating conditions among Dodge dealers and service stations.

Ackerman is Honored

Carl W. Ackerman, assistant to the president of General Motors Corp., directing the public relations activities of that corporation, has been appointed director of the Pulitzer School of Journalism of Columbia University to succeed Dr. John W. Cunliffe, who will retire on June 30. Mr. Ackerman is a graduate of the School of Journalism, and has been active as director of public relations for several large corporations.

Baughman is Reappointed

E. Austin Baughman, Maryland commissioner of motor vehicles, who has filled that position for a number of years, has been reappointed for another two years by Gov. Albert C. Ritchie.

Diamond T Names Ainsworth

David Ainsworth, until recently, assistant advertising manager of the Hart-Parr Co., has been appointed advertising manager of the Diamond T Motor Car Co.

White Promotes Boughton

R. L. Boughton has been appointed vice-president for the export region of the White Co., according to an

announcement from the office of George F. Russell, vice-president and sales manager. He succeeds Thomas Blagden, Jr., resigned.

Mr. Boughton started with the company in February, 1919, and shortly after was appointed export division manager. He will have headquarters at Cleveland.

Thompson Promotes Sevald

Promotion of George V. Sevald to sales manager of the Cleveland equipment division of the Thompson Products Corp. has been announced by Lee M. Clegg, vice-president in charge of sales.

Muncie Names McCall

C. D. McCall has been appointed sales manager of the Detroit office of the Muncie Products Division of the General Motors Corp., succeeding P. A. Collins, who is now with the Olds Motor Works.

Dr. Eckener Arrives

Dr. Hugo Eckener, commander of the Graf Zeppelin, arrived March 3 on the S. S. Europa to discuss plans for another trans-Atlantic flight of that ship.

Olds Shipped 6100

DETROIT, March 2—Preliminary figures for Olds Motor Works show shipments of approximately 6100 cars in February, compared with 4400 cars shipped in January and 6646 in February a year ago. March schedules call for 7500 to 7800 cars.

Ford Salvages 50,000

DETROIT, March 2—Fifty thousand old cars of all makes, many of them obsolete, have been salvaged at the Rouge Plant of the Ford Motor Co. at Dearborn since the company began its salvaging operations a year ago.

N. Y. Merchants Plan Dinner

NEW YORK, March 3—The Automobile Merchants Association of New York, Inc., will hold its seventh annual banquet at the Ritz-Carlton Hotel on Thursday evening, March 19, at 6.30 p. m.

Ex-Cell-O Orders Increase

DETROIT, March 2—Ex-Cell-O Aircraft and Tool Corp. has announced that orders received for airplane parts since the beginning of the year are greater than for the entire year of 1930.

Oakland Shipped 10,007

DETROIT, March 3—Oakland Motor Car Co. February shipments totaled approximately 10,007 cars.

Truck Operators Aid Highway Safety Plans

N.A.C.C. Survey
Reveals This Fact

NEW YORK, March 3—Ninety-seven per cent of the trucks in the country are operated by those who recognize their responsibility for highway safety and insist upon careful driving, according to a national survey now in progress by the National Automobile Chamber of Commerce through the cooperation of local truck associations, chambers of commerce, trade associations and safety councils.

Approximately half the returns are in from this survey and these show that 44 per cent of the fleet operators, operating 74 per cent of the trucks, have driver training systems, and that 94 per cent of the operators, controlling 97 per cent of the trucks, are endeavoring in some way to encourage better driving.

Specific qualifications for drivers are required by 66 per cent of the operators, operating 80 per cent of the trucks, and 69 per cent of the fleets, operating 89 per cent of the trucks, take pains in instructing new drivers. The operators of 46 per cent of the fleets and 61 per cent of the trucks reward good performance by bonuses, salary increases or other means, and 81 per cent of the fleets, controlling 93 per cent of the trucks, penalize poor performance by suspension, dismissal or other means.

Printed or posted rules for safe driving are used by 41 per cent of the operators, controlling 77 per cent of the trucks, and special accident report forms are used by 66 per cent of the fleets, operating 90 per cent of the trucks.

Bill Asks Tax Reduction

BALTIMORE, March 3—An effort to bring about a reduction in the automobile license charges in Maryland is being made in the General Assembly, now in session in Annapolis. A bill has been introduced that would cut the annual license charge to 25 cents per horsepower. For a number of years the license was 60 cents per horsepower, but when the 4-cent gasoline tax was adopted, it was reduced to 32 cents per horsepower. A further reduction would be brought about by the passage of the new measure.

Phelps Gets Flexible Account

CLEVELAND, March 3—The Flexible Co., Loudonville, Ohio, builders of Flexible Buick buses, funeral cars and ambulances, has become a client of George Harrison Phelps, Inc., through its Cleveland division. Plans are being developed, according to H. H. Young, vice-president and general manager of the Flexible Co., for an extensive program of merchandising activity on a much larger scale than ever before attempted in the history of the company.

Hupp Shipped 1908

DETROIT, March 3—Hupp Motor Car Co. shipped 1908 cars in February, compared with 1561 in January, an increase of 22.2 per cent. In February, 1930, the company shipped 2029 cars.

Strip Steel Prices Pushed Upward

Other Descriptions May Advance in Sympathy

NEW YORK, March 5—Steel buyers are wondering whether announcement of a \$1 per ton advance in the second quarter price of hot-rolled strip, and of \$2 a ton in cold-rolled will be followed by stepping up second quarter prices for other descriptions of finished steel products. Strip mills have complained for a long time about the inadequacy of market prices for their products.

Following a long period of abnormally low operating rates, strip mills are now working at a rate that represents an improvement of 40 to 50 per cent over the low of the recent depression, but there remains still considerable slack to be taken up to make the ratio of operations to capacity fairly satisfactory.

In some descriptions of sheets there is also talk of moderate advances. Bar mills have by no means given up the hope that before long the market will be in sufficiently good shape to justify a \$1 per ton advance. For the time being, nearly all sellers are eager to have the other fellow try his hand at putting across an advance, and if he meets with success they are willing to follow his example.

What market leaders are seeking to avoid at this time is advances that can not be firmly maintained for a reasonable length of time. Further gains have been scored in the volume of commitments from automotive consumers, and the general opinion in the market is that March, usually the peak month for steel sales, will be followed this year by a further rise of the demand in April.

Pig Iron—Automotive foundries are taking hold in a more confident manner. Interest in second quarter offerings is on the increase. Production of foundry irons continues light. The market has turned firmer.

Aluminum—The market reflects increased activity at automotive plants. Virgin metal is unchanged. For secondary metal somewhat higher prices are being asked, the 98 @ 99 per cent remelted being quoted at 18 @ 18½ cents in Middle West markets.

Copper—The "official" price of 10½ cents, delivered Connecticut Valley, is being adhered to by custom smelters. Prices for copper and brass products and copper wire have been revised upwards to conform to the higher price for unwrought metal.

Tin—With the restriction of output in producing countries in full effect, the market turned firm, but rather quiet. The week's opening price for spot Straits was 27.15 cents.

Lead—Firm and unchanged.

Zinc—The market is a shade higher with little consuming demand in evidence.

Baltimore Plans Boat Show

BALTIMORE, March 3—The Baltimore Motor Boat Trade Association is planning this year's motor boat show in the Mar-Del Building from March 21 to 23. In addition to all types of boats, accessories will be shown. Henry F. Huber is president of the association.

Buick Shipped 7907

DETROIT, March 3—Buick Motor Co. reports February production and shipments amounting to 7907 cars against 6000 in January. March schedule calls for 10,171 cars.

Continental Gets Contract

DETROIT, March 2—Continental Motors Corp., according to a recent report, has signed a contract to manufacture eight-cylinder engines for one of the largest passenger car companies. The initial order has already been released, and it is expected that upward of 10,000 motors will be built on this contract by the end of the year.

Continental also has the contract for the new DeVaux-Hall six engines on which the March schedule calls for 750 motors, April 1700 and May 3000.

Business, while considerably under the volume for a year ago, has shown a steady increase for the current fiscal year. Increases over the preceding months are as follows: December, 6 per cent; January, 10 per cent, and February 30 per cent. March releases indicate a further substantial gain.

The company's Detroit plant is operating four days a week, and the Muskegon plant five days with shorter hours.

Chevrolet Honors Big Producers

DETROIT, March 7—A group of 1853 automobile salesmen who in 1930 sold 122,819 new cars and 192,589 used cars, an average of 170 cars per man, is being honored this month by the Chevrolet Motor Co.

They are members of Chevrolet's 100-Car Club, made up of salesmen throughout the United States, each of whom sold one hundred or more automobiles in the last fiscal year.

A medal symbolizing his achievement is being presented by Chevrolet to each member of the group, and additional honors are being given the 242, who were the leaders.

Kinner Adds Workers

GLENDAL, CALIF., March 2—In order to fill orders on hand for immediate delivery of approximately 50 engines, Kinner Airplane & Motor Corp., Ltd., is putting to work an extra shift of men on the factory assembly line, Robert Porter, president, announced today. Orders call for shipment of the engines inside of two weeks. Deliveries of engines to date this year total 49 engines, compared with 35 in the first two months of 1930.

Glenn Martin Plant Operating at Capacity

BALTIMORE, MD., March 3—Sufficient orders are on hand at the plant of the Glenn L. Martin Co., Baltimore, airplane manufacturers, to keep the plant in operation at 100 per cent of capacity during the remainder of this year. The concern now has 1800 persons employed.

Automotive Sales Exhibit Paradox

Largest Proportion Got In Small Communities

WASHINGTON, March 5—The proportion of total retail volume represented by automotive sales is inversely proportional to size of city, Census of Distribution figures indicate.

In Chicago, automotive sales, totaling \$252,380,068 in 1929, accounted for only 11.72 per cent of the city's retail volume. In Los Angeles automotive sales amounted to \$220,226,641, or 22.85 per cent of the total. Chicago has a population of 3,375,236 and Los Angeles, 1,238,048.

Smaller cities show larger ratios of automotive sales. The average per cent of retail total represented by automotive sales in five representative cities of the 100,000 population class is 19.36. In five cities of the 50,000 class, it is 22.87. In five cities of the 10,000 class it is 26.5.

A statement by the Bureau points out that since the automotive sales vary considerably among the cities, the average per cent, as a consequence, is always low. Hence the average for Chicago and Los Angeles is 17.29, although Los Angeles showed a return of 22.85.

"Sales of all commodities are dependent upon many conditions other than density of population," says the statement. Climatic and industrial conditions wield great influence on retail sales. The trading territory of the city and its location in an agricultural or industrial section are likewise governing factors.

Chrysler Shifts Production

DETROIT, March 3—As a result of recent increases in tariff rates on motor cars, the Chrysler Corp. of Canada, according to an announcement by John D. Mansfield, president, has taken over the manufacture of two further lines of Chrysler products formerly imported from Detroit. These are the Dodge Bros. trucks and the Chrysler Imperial. They will be put into production in the Canadian plant in addition to other Chrysler lines as soon as possible.

American Cirrus Purchased

MARYSVILLE, March 4—American Cirrus Engines, Inc., has been purchased by a financial group represented by Lee Hammond of Chicago, and a new corporation will shortly be formed. W. R. Blacklock, treasurer of the former company, will head the new concern, with Farr Nutter as sales manager and W. W. Finlay, chief engineer. Price reductions of \$400 have been announced on both the upright and inverted type engine. The former now lists at \$795 and the inverted 95-hp. type at \$895.

Studebaker Making New Type

DETROIT, March 3—Announcement has been made by the Studebaker Corp. that the six-cylinder roadster listing at \$795 has now been placed in production.

Exports, Imports and Reimports of the Automotive Industry for January, 1931-1930, and Six Months Ended December, 1930-1929

	Month of January		Six Months Ended December	
	Number	Value	Number	Value
	1931	1930	1930	1929
Automobiles, parts and accessories .....	..	\$14,352,704	..	\$29,097,862
*Electric trucks and passenger cars .....	..	7	..	12,627
Motor trucks and buses except electric (total)	4,534	2,367,446	12,876	7,617,086
Up to one ton inclusive	574	196,253	8,856	3,991,810
Over 1 and up to 2 1/2 tons	3,809	1,947,650	3,751	2,994,330
Over 2 1/2 tons	103	197,614	269	630,946
PASSENGER CARS				
Passenger cars except electric (total)	8,304	4,881,865	15,293	11,073,643
Low price range \$850 inclusive	6,587	2,925,094	10,810	5,568,017
**Medium price range over \$850 to \$1,200	1,023	970,605	3,894	4,101,756
**\$1,200 to \$2,000	247	378,533	..	..
**Over \$2,000	207	496,611	589	1,403,870
PARTS, ETC.				
Parts, except engines and tires .....	..	..	..	..
Automobile unit assemblies .....	..	4,055,651	..	5,018,916
Automobile parts for replacement (n.e.s.) .....	..	2,565,373	..	4,462,307
Automobile accessories .....	..	304,893	..	540,627
Automobile service appliances (n.e.s.) .....	..	245,190	..	760,018
Trailers	38	20,887	61	57,826
Airplanes, seaplanes and other aircraft	12	202,853	17	274,189
Parts of airplanes, except engines and tires .....	..	205,847	..	198,312
BICYCLES, ETC.				
Bicycles	201	5,364	420	12,649
Motorcycles	328	79,303	1,321	305,384
Parts and accessories, except tires .....	..	44,646	..	110,463
INTERNAL COMBUSTION ENGINES				
Stationary and Portable .....	..	..	..	..
Diesel and Semi-Diesel .....	..	20,700	34	111,999
Other stationary and portable: .....	..	..	..	..
Not over 10 hp. ....	..	64,653	2,912	225,546
Over 10 hp. ....	..	142,666	388	205,008
Automobile engines for: .....	..	..	..	..
Motor trucks and buses	641	85,426	165	43,087
Passenger cars	1,037	92,050	2,492	250,728
Tractors	2	1,007	8	2,740
Aircraft	15	112,127	25	100,748
Accessories and parts (carburetors) .....	..	180,566	..	292,076
IMPORTS				
Automobiles and chassis (dutiable)	40	15,474	37	49,479
Other vehicles and parts for them (dutiable) .....	..	2,807	..	21,766
REIMPORTS				
Automobiles (free from duty)	21	34,587	18	13,118

*Not shown separately after 1930.

**Classification changed beginning January, 1931.

Natural Gasoline Output Rises

WASHINGTON, March 2—The world production of natural gasoline increased from 41,470,069 bbl. in 1927 to 58,200,357 bbl. in 1929, a gain of 16,730,288 bbl., or 40 per cent, according to the United States Bureau of Mines, Department of Commerce, following the completion of a survey conducted by E. B. Swanson, Chief Petroleum Economist.

During the period covered by the survey, United States production accounted for more than 90 per cent of the world total, but the output of foreign plants formed an increasing proportion of the total, advancing from 5.8 per cent of the total in 1927 to 8.6 per cent in 1929.

Milwaukee Plant Stepped Up

MILWAUKEE, March 2—Production at the Milwaukee Ford assembly plant was stepped up further today, the March schedule being for 1500 cars, compared with 1200 in February. Seventy-five have been added to the payroll, increasing the staff to 675.

Revises Aero Bulletins

WASHINGTON, March 2—Publication of two revised Aeronautics Bulletins has been announced by the Aeronautics Branch, Department of

Commerce. Bulletins No 7-A, "Airworthiness Requirements of Air Commerce Regulations of Aircraft" and No. 5 "Airports and Landing Fields," both revised to Jan. 1, may be obtained gratis by application to the Aeronautics Branch.

Leases Old Dodge Plant

TORONTO, ONT., March 3—Philco Products Limited of Canada, manufacturers of radio sets, which less than a year ago leased 3600 sq. ft. of space in the Terminal Warehouse Building, this city, to carry on assembling processes, have just completed arrangements whereby they are leasing 16,000 sq. ft. in the old Dodge Motor Co.'s plant in Toronto, where it will not only continue to assemble its products but will manufacture parts.

Eaton Spring to Resume

MASSILLON, OHIO, March 2—The Eaton Spring Corp., idle since April 15, 1930, will resume operations within the next 2 weeks, according to an announcement by J. F. Beans, general manager of the corporation.

The plant will reopen with a force of 50 to 75 men manufacturing springs for trucks and passenger cars.

Kelsey Sells Aero Interests

DETROIT, March 2—Sale of the airplane interests of the Kelsey-Hayes Wheel Corp. to the Airplane Wheel & Rim Corp., Binghamton, N. Y., has been confirmed by both companies, and inquiries are being referred to the latter. O. W. Mott, who has been in charge of the Kelsey-Hayes airplane business, continues with the Airplane Wheel & Rim Corp. The Kelsey-Hayes mark will not appear on airplane wheels manufactured by the purchasing company.

Wilmington Show Successful

WILMINGTON, DEL., March 3—The Wilmington Automobile Show, which closed last Saturday night, was one of the most successful of all shows yet held. The attendance, according to members of the committee in charge, far exceeded that of last year. There were more sales, in proportion to attendance, than at any preceding show. The total attendance was estimated at 10,000.

Hanford S. Moore

NEW YORK, March 2—Hanford S. Moore, wholesale manager of the Hudson Motor Car Co. of New York, died at his home in White Plains last week of heart disease. He was 56 years old.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, March 4—There were some indications last week of improvement in business in the West. For the country as a whole, the weather has been too springlike for winter lines; and spring trade has not yet gained any degree of momentum. Cotton textiles made a better showing than most lines. Although the margin of profit for the cotton mills is small, some operators are doing a fairly good business; and a few mills in the South reported the resumption of the night shift.

DEPARTMENT STORE SALES

The monthly review of the Federal Reserve Bank of New York stated that department store sales during January in that district were 7.6 per cent below those a year ago, while sales of chain stores were 1.3 per cent below.

WATER POWER

The total capacity of water wheels at water power plants in the United States at the beginning of this year, according to the Department of the Interior, amounted to 14,884,667 horsepower, which marks an increase of 1,076,889 horsepower, or 7.2 per cent, above that a year earlier.

LUMBER OUTPUT

Production of lumber by leading hardwood and softwood mills during the week ended February 21 amounted to 194,409,000 feet. Shipments were 16 per cent above production and new business 22 per cent above. The week ended February 21 marked the eighth consecutive week in which new orders exceeded production.

CAR LOADINGS

Railway freight loadings during the week ended Feb. 14 totaled 720,689 cars. This was an increase of 1636 cars above those in the preceding week, but a decrease of 172,451 cars below those a year ago and a decrease of 236,809 cars below those two years ago.

CRUDE OIL OUTPUT

Average daily crude oil production during the week ended Feb. 21 amounted to 2,165,250 barrels, as against 2,127,700 barrels for the preceding week, and 2,722,050 barrels a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Feb. 28 stood at 75.8 per cent, as against 75.8 per cent the week before and 76.3 per cent two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Feb. 25 were 23 per cent below those a year ago.

STOCK MARKET

The stock market last week continued the buoyancy that had been in evidence for the several weeks preceding. Although there were sharp reactions from time to time, the underlying tone remained confident. Trading was on a large scale and on Tuesday exceeded 5,000,000 shares. Most issues closed the week with net gains. Railway issues, however, were among those that showed no improvement during the week, which was mostly the result of the poor earnings reported for January.

BROKERS' LOANS

Brokers' loans in New York City during the week ended Feb. 25 increased \$26,000,000, marking a total increase of \$82,000,000 for the three weeks ended Feb. 25.

RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Feb. 25 showed a decrease of \$10,000,000 in discounted bills.

Warner and Grossman Speak

TORONTO, March 2—Speakers at the recent monthly dinner meeting of the Canadian Section, Society of Automotive Engineers, included John A. C. Warner, general manager, Society of Automotive Engineers, and D.R. Grossman, president and general manager of the Studebaker Corp. of Canada, Ltd., Walkerville.

Illinois' Sales Increase

CHICAGO, March 2—Spring-like weather and improved business conditions are credited with being largely responsible for an increase of new automobile sales in Illinois in February, as compared with January, according to the monthly statement from the Illinois Chamber of Commerce listing February sales at 9772 cars, an increase of 416 over the January total.

Considerable satisfaction is evidenced over the fact that this is the third consecutive month in which an increase has been noted. December sales were 2987 cars, as compared with 9356 in January and 9772 in February. Cook county accounted for 5298 of the February totals with downstate counties buying 4474 new cars.

Importers to Fight Tariff

MONTREAL, March 2—Plans to fight the recent Order in Council, affording increased protection to Canadian-made cars and trucks, were discussed at a meeting of the Automobile Importers' Association, held in the Mount Royal Hotel, Feb. 27, at which F. A. Nancekivell, Reo distributor, acted as chairman.

Among those present at the meeting were representatives from Winnipeg, Toronto, Ottawa, Simcoe, Halifax, St. John and Montreal.

Gregory May Resume

VANCOUVER, B. C., March 2—After being closed down for a number of months, the plant of the Gregory Tire Co., Port Coquitlam, in the vicinity of Vancouver, is expected to reopen very shortly. Only a small staff would be taken on at first. Directors of the plant have asked the city council for a fixed assessment, and reopening depends largely on the decision of that body.

Chevrolet Produced 67,318

DETROIT, March 3—Chevrolet Motor Co. reports production for February of 67,318 cars and trucks. March schedules call for approximately 78,000 units.

Graham Produced 2514

DETROIT, March 3—Graham-Paige Motors Corp. reports February production of 2514 cars against January production of 2112 units.

S. W. Railroads Ask Leave to Cut Rates

Would Reduce Some Car Shipping Codes

WASHINGTON, March 3—Alarmed by motor truck competition, Southwestern railroads have petitioned the Interstate Commerce Commission to permit them to establish greatly reduced rates on passenger automobiles from specific producing, manufacturing and assembling plants for hauls up to 500 miles in the Southwest and Kansas-Missouri territories. The petition seeks to transfer the rates from the existing first-class scale to a commodity basis and sets up a proposed scale with rates.

The rates are proposed for shipments in carloads of cars 40 ft., 6 in. or less in length, this being the standard car of the Southwestern carriers for automobile traffic. The petition says it is not believed any necessity will exist for cars of greater length, but that it is the intention should the necessity developed for rates on longer cars to provide rates on a relative basis, considering the increased loading possibilities in such longer cars, compared with cars 40 ft., 6 in. in length. Should such a condition arise, the petition says, further application will be made to meet it.

The petition is in the nature of a special request to depart from the first-class mileage scale prescribed by the Commission in the so-called Consolidated Southwestern cases. The action of the Commission necessarily cannot be anticipated, but that it may be granted is indicated from the fact that the Southwestern carriers petitioned successfully to the Commission recently to depart from the scale and establish lower rates on cotton, representing a heavy traffic in the Southwest, on which motor truck competition made heavy inroads on rail traffic.

The extent of the proposed reductions is indicated from the fact that the minimum slash in rates would be \$9.38 per automobile on hauls of 500 miles, which would be cut to \$185 from \$194.38, while the maximum cut would be \$64.24 per automobile on hauls between 160 and 170 miles, the proposed rate being \$50 against the existing rate of \$114.24.

The points from which it is proposed to base the rates are St. Louis, Kansas City, Des Moines, Iowa; Omaha, Denver, Memphis, Tenn.; New Orleans, Houston, Tex.; Dallas, Tex., and Oklahoma City, Okla.

Russell to Add Capital

MIDDLETOWN, CONN., March 2—The Russell Manufacturing Company has asked the Connecticut legislature to permit it to increase its capital stock to not more than \$5,000,000, and to make some other minor changes in its charter. The bill was referred to the Committee on Incorporations, which reported favorably Feb. 18.

Dan V. Goodman

CHICAGO, March 2—Dan V. Goodman, widely known in the newspaper and automotive field, died Saturday night at the naval hospital at Great Lakes, Ill., after an emergency operation. In the early part of 1930, he was automobile editor of The Chicago Evening Post.

Conference Committee Cites More Legislation

Many Bills Were
Introduced in February

NEW YORK, March 2—During the last two weeks in February a number of additional bills were introduced in the various state legislatures affecting the automotive industry in one way or another, according to a digest just prepared by the Motor Vehicle Conference Committee.

There were 14 additional bills tending to increase the regulation and taxation of motor trucks, three bills propose increased gas taxes, while two bills propose that two per cent of the gas tax shall go to the distributors. There were ten bills for increased regulation and taxation of buses, eight miscellaneous taxation bills, and seven bills which would call for special equipment of vehicles.

There were 13 additional bills changing size regulations and eleven changing weight restrictions. There were also an additional 13 bills of a miscellaneous nature, including compulsory insurance, licensing of mechanics, compulsory inspection of equipment, and full stop at school zones.

Materials' Prices Decline

NEW YORK, March 3—Automotive raw material prices in the middle of February, according to the Index compiled by Ray B. Prescott for *Automotive Industries*, stood at 96, compared with 98 for January, continuing the decline which has been in effect for many months. In the middle of February, 1930, the Index stood at 117. The Bradstreet raw material price index for February, 1931, stood at 104. The same relatives are used for the automotive and the Bradstreet indices.

Zenith Mfg. Corp. to Add

MILWAUKEE, March 2—The Zenith Mfg. Corp., 619 Center Street, manufacturing high-speed automotive equipment, including cylinder heads, for Ford and Chevrolet replacements, overhead valves, airplane carburetors and heaters, is planning to erect a plant addition costing \$115,000 with new machinery as the result of marked improvement in sales for immediate and future delivery. Work will start about April 1.

Moto Meter Recalls 100

LA CROSSE, WIS., March 2—Recalling of 100 employees by the La Crosse division of the Moto Meter Gauge & Equipment Corp. during the past week was made possible by the release of a number of substantial orders from Auburn, Chrysler, Hudson and Nash, it was announced by Byron A. Fay, general manager of the division. There still are numerous large orders

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Geneva, AutomobileMarch 6-15
Los Angeles (Transportation).....March 15-28
Altoona, Pa., Automobile.....April 15-27
International Garage Exposition, Berlin, GermanyMay 9-Aug. 9

CONVENTIONS

American Chemical Society, Indianapolis, Ind.March 30-April 4
Washington Motor Freight Assn., Meeting, Seattle, Wash.April 11-13
Aeronautical Chamber of Commerce, DetroitApril 11-19
S.A.E. Natl. Aeronautic Meeting, Detroit, Mich.April 15-16
Middle Atlantic Jobbers Convention, Philadelphia, Pa.April 20-21
American Welding Society Meeting, New York, N. Y.April 22-24
Natl. Battery Mfg. Assn. Convention, Niagara FallsApril 24-25
Retail Delivery Assn. Convention, Washington, D. C.May 25-28
U. S. Chamber of Commerce, Atlantic CityApril 28-May 1
International Chamber of Commerce, Washington, D. C.May 4-9
National Foreign Trade Council, New YorkMay 27-29
Fourth National Oil and Gas Power Meeting, A.S.M.E., Madison, Wis., June 15-18
S.A.E. Summer Meeting, White Sulphur SpringsJune 15-19
S.A.E. Aeronautic Meeting (in conjunction with Natl. Air Races), Cleveland, OhioSept. 1-3

subject to release. The payroll now is somewhat in excess of 700.

Pearson is Decorated

WASHINGTON, March 2—A. C. Pearson, chairman of the United Business Publishers, of which *Automotive Industries* is a unit, was awarded the decoration of the Legion of Honor by Major Georges Thenault, assistant military attache of the French embassy, at a ceremony in the Carlton Hotel, Washington, Feb. 23, before a distinguished company. The bright ribbon given Mr. Pearson, making him a Chevalier of the Legion, cited him for services to France during the World War.

Allis Tractor Sales Are Good

MILWAUKEE, March 2—Actual business done by the tractor division of the Allis-Chalmers Mfg. Co. so far this year has been bigger than any previous similar period in the history of the business, according to H. C. Merritt, manager of the division.

Jackson Releases Increase

CHICAGO, March 2—Releases of crankshaft orders to automobile manufacturers are increasing, T. M. Carpenter, vice-president and general manager of the Jackson Motor Shaft Co., said today.

Listed Motor Stocks Appreciate Sharply

Seven Issues Increase
16.6 Per Cent in Value

NEW YORK, March 2—Stock of seven car manufacturers listed on the New York Stock Exchange increased in value during February \$336,750,000, or 16.6 per cent, according to Frazier Jelke & Co., New York banking house. This group contributed to a general advance of 11.2 per cent registered by 100 representative common stocks in 13 different groups used to establish an index.

Groups showing a greater advance than motors include amusements at 34.4 per cent, mines at 27.3 per cent, and electrical manufacturing 19.2 per cent. Groups advancing to a less extent include chemicals at 14.7 per cent, utilities at 14.5 per cent, merchandising companies at 13 per cent, steels at 10.7 per cent, industrials at 10.2 per cent, oils at 5.6 per cent, railroad equipments at 5 per cent, foods at 4.9 per cent and rails at 2.7 per cent. There were no declines during the month.

The total value of these stocks at the end of February was greater than at any time since September, 1930:

British Sales Increase

LONDON, Feb. 23 (by mail)—The Ministry of Transport returns of new cars registered during the last three months of 1930 show higher figures for October and December than for those months of 1929, though in November there was a reduction. The totals for the three months were:

	1930	1929
October	11,212	9,853
November	10,972	11,664
December	12,556	11,171
	34,740	32,688

The increase in October followed one in September, though prior to the latter there had been reduced registrations during each month since February last year. The totals for the two full years were:
1930....201,980 1929....213,839

Buick Adds Two Types

DETROIT, March 2—Addition of two new four-passenger convertible coupes to the 1931 line of Buick straight-eights has been announced by the Buick Motor Co. The new body types are offered in two different series, one on the 114-in. chassis, listing at \$1,095, the other on the 132-in. wheelbase chassis, listing at \$1,785. Both of the new coupes are equipped with adjustable seats, two top-cowl ventilators and forward-folding windshields.

Harry P. Readmon

NEW YORK, March 2—Harry P. Readmon, 53 years old, purchasing agent of the Chicago Pneumatic Tool Co. for the past 12 years, died Feb. 26, according to an announcement from the company.